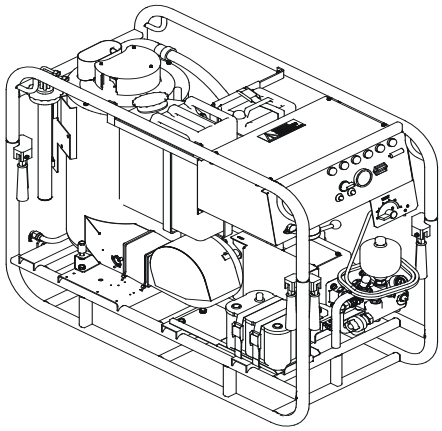
ARMY TM 3-4230-238-23&P
MARINE CORPS TM 12112A-OI
NAVY S9523-AN-MMM-010

TECHNICAL MANUAL

FIELD MAINTENANCE MANUAL
INCLUDING REPAIR PARTS AND SPECIAL TOOLS LIST
FOR

DECONTAMINATING APPARATUS: JOINT SERVICE TRANSPORTABLE SMALL SCALE, M26 (NSN 4230-01-555-0686) (EIC ZJ4)



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HEADQUARTERS, DEPARTMENTS OF THE ARMY AND NAVY
HEADQUARTERS, MARINE CORPS
5 NOVEMBER 2009

0910-LP-107-7309 **PCN 184 121121 01**

WARNING SUMMARY

GENERAL INFORMATION

Warnings contain information that if ignored could result in death or injury to personnel. Cautions contain information that if ignored could result in damage to equipment. Notes contain instructional information.

This manual contains Warnings, Cautions, and Notes.

FIRST AID DATA

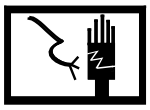
For general information about first aid see:

FM 4-25.11 (Army)
NTRP 4-02.1.1 (Navy)
MCRP 3-02G (Marine Corps)

EXPLANATION OF SAFETY WARNING ICONS

EAR PROTECTION

EAR PROTECTION - Headphones over ears shows that noise level will harm ears.



ELECTRICAL

ELECTRICAL - Electrical wire to hand with electricity symbol running through hand shows that shock hazard is present.

HEAVY OBJECTS

HEAVY OBJECTS - Human figure bending over heavy object shows physical injury potential from improper lifting technique.

HIGH PRESSURE

HIGH PRESSURE - Arrow penetrating hand shows that skin may be penetrated by air or other contaminants.

HOT AREA

HOT AREA - Hand over object radiating heat shows that part is hot and can burn.

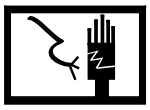
GENERAL SAFETY WARNINGS DESCRIPTION

WARNING

EAR PROTECTION

NOISE – During operation, the applicator module produces high noise levels that can lead to hearing impairments. Use hearing protection within 50 feet. Hearing can be permanently damaged if exposed to constant high noise.

WARNING



ELECTRICAL

ELECTRICAL – Do not spray any water or liquids into the control panel or any other electrical components. This could cause injury or death to personnel and damage to the equipment.
Always disconnect battery cables before performing maintenance to prevent electrical shock which could cause injury or death.

WARNING

HEAVY OBJECTS

AVOID LIFTING INJURY – Serious injury could occur if this system or any heavy equipment is moved/lifted without Material Handling Equipment (MHE). Only use MHE if a component weights over 150 pounds. Use proper physical lifting procedures or use a suitable lifting devices or dolly for light components. The Initial Setup block will indicate the number of personnel required to do the job. Always use the number of personnel called for by the procedures to move or relocate the M-26 equipment. Wear safety shoes, gloves and other suitable protective clothing.

WARNING

HIGH PRESSURE

HIGH PRESSSURE – The high pressure stream of fluid produced by this system can pierce skin and its underlying tissues, leading to serious injury. Do not direct discharge at anyone.

WARNING

HOT AREA

HOT SYSTEM COMPONENTS – The engine exhaust, flow heater exhaust, flow heater housing, the safety temperature valve, the spray lance's metal components, and spray hoses become very hot during system operation. Severe burns may result if any of these components are handled while still hot.

HOT WATER BURNS – Water from this system may reach 175 degrees Fahrenheit. Avoid coming in contact with the hot water stream from the system during operation. Never spray the system's water stream in the direction of any personnel.

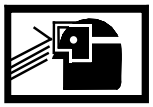
HAZARDOUS MATERIALS WARNING ICONS

WARNING

CHEMICAL

CHEMICAL - Drops of liquid on hand shows that the material will cause burns or irritation to human skin or tissue.

WARNING



EYE PROTECTION

EYE PROTECTION - Person with goggles shows that the material will injure the eyes.

WARNING

FIRE

FIRE - Flame shows that a material may ignite and cause burns.

WARNING

POISON

POISON - Skull and crossbones shows that a material is poisonous or is a danger to life.

WARNING

VAPOR

VAPOR - Human figure in a cloud shows that material vapors present a danger to life or health.

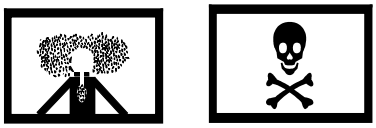
WARNING

EXPLOSION

EXPLOSION – Rapidly expanding symbol shows that the material may explode if subjected to high temperatures, sources of ignition or high pressure.

HAZARDOUS MATERIALS DESCRIPTION

WARNING

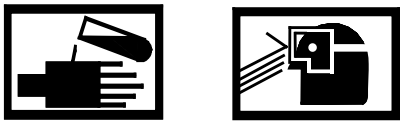


VAPOR **POISON**

CARBON MONOXIDE

Carbon monoxide (exhaust gas) is colorless, odorless and tasteless and breathing it in high concentrations can kill you. Operate applicator module outdoors or duct system outdoors. If anyone shows symptoms of carbon monoxide poisoning, such as a severe headache, dizziness, and nausea, take the exposed person into the fresh air as quickly as possible. Give artificial respiration if breathing has stopped. Seek medical attention immediately.

WARNING

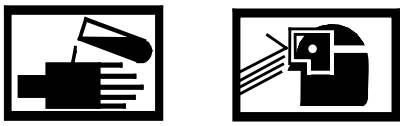


CHEMICAL **EYE PROTECTION**

GENERAL PURPOSE (GP) SOAP

Even though GP soap poses a very low health hazard, the compound is a slight irritant to eyes and may be harmful if ingested. When handling and using this product, wear eye protection, protective clothing, and protective gloves. First aid for eye contact: flush eyes with clean water for 15 minutes lifting upper and lower eyelids occasionally. If irritation persists, seek medical attention. For toxic exposure or allergic reaction, seek medical attention.

WARNING



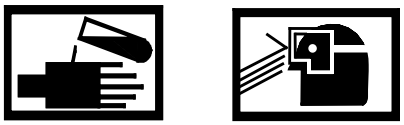
CHEMICAL **EYE PROTECTION**

WATER PUMP LUBRICANT

When working with water pump lubricant, avoid contact with eyes or skin. Wear eye protection, protective clothing, and protective gloves. Use only with adequate ventilation. Accidental ingestion of this material may cause irritation of digestive tract. First aid for ingestion: do not induce vomiting. Give activated charcoal (given by medical personnel only). Rinse out mouth and drink plenty of water. Seek medical attention. First aid for skin contact: remove excess with a dry cloth. Wash skin with soap and water. Do not use organic solvents. Seek medical attention if skin irritation persists. First aid for eye contact: rinse with plenty of water carefully. In the event of persistent symptoms, seek medical attention. First aid for inhalation: move to fresh air. In the event of symptoms, seek medical attention.

HAZARDOUS MATERIALS DESCRIPTION – CONTINUED

WARNING

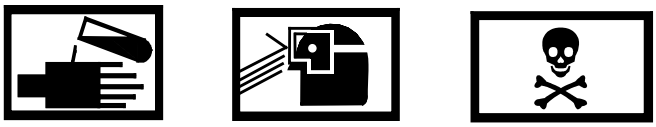


CHEMICAL **EYE PROTECTION**

PUMP OIL

Under normal conditions of intended use, pump oil does not pose a risk to health. Excessive exposure may result in eye, skin, or respiratory irritation. Wear eye protection, protective clothing, and protective gloves when handling and using this product. Use only with adequate ventilation. First aid for ingestion: do not induce vomiting. Seek medical attention immediately. First aid for skin contact: wipe off excess material. Wash exposed skin with mild soap and water. Seek medical attention if skin damage or if pain or irritation persists. Thoroughly clean contaminated clothing before reuse. Discard contaminated leather goods. If material is injected under the skin, seek medical attention immediately. First aid for inhalation: move to fresh air. If breathing is difficult, give oxygen. If symptoms persist, seek medical attention.

WARNING

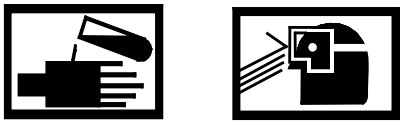


CHEMICAL **EYE PROTECTION** **POISON**

ETHYLENE GLYCOL ANTIFREEZE

When working with ethylene glycol antifreeze, avoid contact with eyes, skin, or clothing. Wear eye protection, protective clothing, and protective gloves. This product is a mild to moderate eye irritant if exposed directly in the eye. First aid for eye contact: immediately rinse the eyes with large amounts of cool water for 15 minutes, and then seek medical attention. First aid for skin contact: thoroughly rinse skin with water. Remove contaminated clothing and launder before reuse. This product is highly toxic if ingested. Ingestion causes drunkenness rapidly passing into a coma and is associated with serious or fatal kidney injury. First aid for ingestion: rinse mouth and seek immediate medical attention. First aid for inhalation: move to fresh air and seek medical attention. Dispose of this product in accordance with local, state, and Federal hazardous waste regulations.

WARNING



CHEMICAL **EYE PROTECTION**

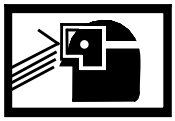
CALCIUM INHIBITOR

When working with a calcium inhibitor, wear protective clothing, protective rubber gloves, and chemical splash goggles. This product is very mildly hazardous and has minimal negative effects on the human body. Use only with adequate ventilation. First aid for ingestion: rinse out mouth and then drink plenty of water. First aid for skin contact: rinse of with warm water. First aid for eye contact: rinse open eye for several minutes under running water. If irritation persists, seek medical attention

HAZARDOUS MATERIALS DESCRIPTION – CONTINUED

WARNING

CHEMICAL



EYE PROTECTION

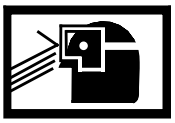
POISON

PROPYLENE GLYCOL ANTIFREEZE

When working with propylene glycol antifreeze, avoid contact with eyes, skin, or clothing. Wear eye protection, protective clothing, and protective gloves. This product is a mild to moderate eye irritant if exposed directly in the eye. First aid for eye contact: immediately rinse the eyes with large amounts of clean water for 15 minutes, holding eyelids open. Seek immediate medical attention if irritation or redness persists. Exposing this product directly to the skin could cause mild irritation. First aid for skin contact: wash skin with soap and water. Remove contaminated clothing and launder before reuse. This product is highly toxic if ingested. Ingestion of this product may cause adverse reactions to include abdominal spasms, vomiting, unconsciousness, and kidney damage. First aid for ingestion: rinse mouth and seek immediate medical attention. First aid for inhalation: move to fresh air and seek medical attention. Dispose of this product in accordance with local, state, and Federal hazardous waste regulations.

WARNING

CHEMICAL



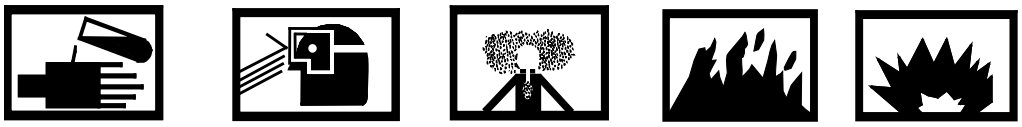
EYE PROTECTION

CALCIUM/LIME/RUST (CLR) CLEANER

When working with CLR, avoid contact with eyes or skin. May cause burns to eyes and skin. Wear protective gloves, protective clothing, and chemical splash goggles. The compound is mildly toxic and can cause eye corrosion and may cause skin irritation with discomfort or rash. Prolonged skin contact may cause ulceration. First aid for skin contact: remove contaminated clothing, cutting it if necessary. Seek immediate medical attention. Accidental ingestion of this product may cause irritation of the gastrointestinal tract with abdominal pain, nausea, vomiting and diarrhea and corrosion of the mucous membranes. First aid for ingestion: do not induce vomiting. Seek immediate medical attention. First aid for eye contact: seek immediate medical attention. Excessive inhalation may cause irritation of the respiratory passages. First aid for inhalation: move to fresh air. If irritation persists, seek medical attention. Dispose of this product in accordance with local, state, and Federal hazardous waste regulations.

HAZARDOUS MATERIALS DESCRIPTION – CONTINUED

WARNING

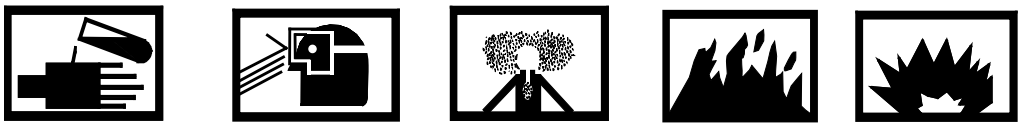


CHEMICAL **EYE PROTECTION** **VAPOR** **FIRE** **EXPLOSION**

JP-8 FUEL

When working with JP-8 fuel, avoid contact with eyes. Avoid prolonged or repeated contact with skin. Wear protective clothing, protective rubber gloves, and chemical splash goggles. Avoid prolonged or repeated breathing of vapors. Use only with adequate ventilation. Overexposure to vapors can irritate digestive tract. Aspiration into lungs may cause hemorrhaging. First aid for ingestion: do not induce vomiting. Seek immediate medical attention. First aid for skin contact: remove contaminated clothing. Wash skin thoroughly with soap and water. Launder contaminated clothing immediately and discard contaminated leather goods. If symptoms persist, seek medical attention. First aid for eye contact: immediately flush eyes with plenty of water for at least 15 minutes, retracting eyelids often. Tilt the head to prevent chemical from transferring to the uncontaminated eye. Serious harm may result if treatment is delayed. Seek immediate medical attention and continue to flush eyes while awaiting medical attention. Monitor the eye daily as advised by a physician. First aid for inhalation: move to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Seek immediate medical attention. Dispose of this product in accordance with local, state, and Federal hazardous waste regulations.

WARNING



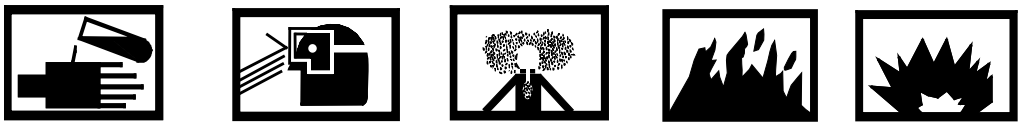
CHEMICAL **EYE PROTECTION** **VAPOR** **FIRE** **EXPLOSION**

DIESEL FUEL

When working with diesel fuel, avoid contact with eyes. Avoid prolonged or repeated contact with skin. Wear protective clothing, protective rubber gloves, and chemical splash goggles. Avoid prolonged or repeated breathing of vapors. Use only with adequate ventilation. Overexposure can irritate digestive tract. Aspiration into lungs may cause hemorrhaging. First aid for ingestion: do not induce vomiting. Seek immediate medical attention. First aid for skin contact: remove contaminated clothing. Wash skin thoroughly with soap and water. Launder contaminated clothing immediately and discard contaminated leather goods. If symptoms persist, seek medical attention. First aid for eye contact: immediately flush eyes with plenty of water for at least 15 minutes, retracting eyelids often. Tilt the head to prevent chemical from transferring to the uncontaminated eye. Serious harm may result if treatment is delayed. Seek immediate medical attention and continue to flush eyes while awaiting medical attention. Monitor the eye daily as advised by a physician. First aid for inhalation: move to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Seek immediate medical attention. Dispose of this product in accordance with local, state, and Federal hazardous waste regulations.

HAZARDOUS MATERIALS DESCRIPTION – CONTINUED

WARNING



CHEMICAL EYE PROTECTION VAPOR FIRE EXPLOSION

FUEL SPILLS

A small priming spill is not usually dangerous. Use the spill kits bag of granular sorbent to spread over the spill. Dig up the sorbent and contaminated soil using the 2-piece non-sparking shovel and place the sorbent and soil in plastic disposal bags. Use tie strips to seal the bags. Store and transport the bags in the 55 gallon drums marked with the hazardous material caution plate. A fire guard should stand by the spill area with a fire extinguisher until the cleanup operation is completed.

Death or severe injury can occur from fire and explosion of fuels. Spilled fuel can ignite or explode and cause serious injury or death to operating personnel. To avoid fire and explosion during all fuel spill cleanup procedures:

Do not allow any flame producing material within 100 feet of the M-26.

Do not smoke or allow smoking during refueling operations. Smoking is prohibited around the M-26.

Do not allow fuel to drip onto hot surfaces.

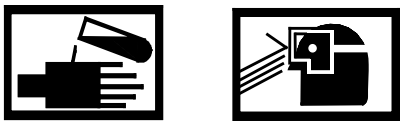
Do not refuel equipment while its engine is running.

Do not allow spilled fuel to come in contact with exposed skin. ALWAYS wear gloves when cleaning up a fuel spill.

Do not allow spilled fuel to get in eyes. ALWAYS wear goggles when cleaning up any fuel spill.

Do not use rags to clean up the spill if low flash fuel such as AVGAS or JP-4.

WARNING

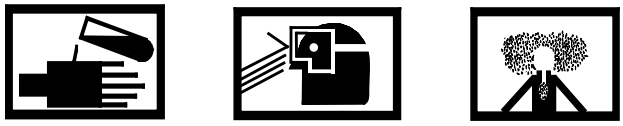


CHEMICAL EYE PROTECTION

MOTOR OIL

When working with motor oil, avoid contact with eyes. Wear protective clothing and protective rubber gloves. First aid for ingestion: do not induce vomiting. If illness or adverse symptoms develop, seek immediate medical attention. First aid for skin contact: wash skin thoroughly with soap and water. Launder contaminated clothing immediately. First aid for eye contact: immediately flush eyes with plenty of water for at least 15 minutes. Seek immediate medical attention if irritation or adverse symptoms develop. Avoid prolonged or repeated inhalation of oil mist. First aid for inhalation: move to fresh air. If coughing or difficulty breathing develops, seek medical attention. Dispose of this product in accordance with local, state, and Federal hazardous waste regulations.

WARNING

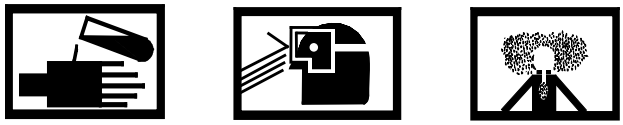


CHEMICAL **EYE PROTECTION** **VAPOR**

SOLVENT, DRY CLEANING COMPOUND

Dry cleaning solvent is moderately toxic to the skin, eyes, and respiratory tract irritation. Avoid prolonged exposure. Wear protective rubber gloves and chemical splash goggles or face shield to avoid skin or eye contact. Use in a well ventilated area. First aid for skin contact: remove any contaminated clothing and wash skin thoroughly with soap and water. First aid for eye contact: flush with water for 15 minutes or until irritation subsides. If irritation persists, call a physician. If overcome by vapors, move from exposed area and call a physician. In case of ingestion, do not induce vomiting, call a physician immediately.

WARNING



CHEMICAL **EYE PROTECTION** **VAPOR**

SOLVENT CLEANING COMPOUND, MIL-PRF-680

Cleaning solvents can cause eye and skin irritation. Wear protective rubber gloves and chemical splash goggles or face shield to avoid skin or eye contact. Use in a well ventilated area. First aid for skin contact: remove any contaminated clothing and wash skin thoroughly with soap and water. First aid for eye contact: flush with water for 15 minutes or until irritation subsides. If irritation persists, call a physician. If overcome by vapors, move from exposed area and call a physician. In case of ingestion, do not induce vomiting, call a physician immediately.

CHANGE NO. 1

**HEADQUARTERS
DEPARTMENTS OF THE ARMY AND NAVY
HEADQUARTERS, MARINE CORPS
WASHINGTON, D.C., 31 DECEMBER 2012**

TECHNICAL MANUAL

FIELD MAINTENANCE MANUAL FOR DECONTAMINATING APPARATUS: JOINT SERVICE TRANSPORTABLE SMALL SCALE, M26 NSN 4230-01-555-0686 (EIC: ZJ4)

DISTRIBUTION STATEMENT C – Distribution authorized to U.S. Government Agencies and their contractors. This publication is required for administrative and operational purposes as determined 28 April 2004. Other requests for this document shall be referred to U.S. Army, TACOM Life Cycle Management Command, ATTN: AMSTA-LCL-MPP/TECH PUBS 6501 E. 11 Mile Road, Warren, MI 48397-5000. NAVY: Requests for this document shall be referred to Commander, Naval Surface Warfare Center Division, Naval Systems Data Support Activity, Code 310, 4363 Missile Way, Port Hueneme, CA 93043-4307. MARINE CORPS: Requests for this document shall be referred to: Commandant of the Marine Corps (ARD), Washington D.C. 20380-0001.

ARMY TM 3-4230-238-23&P and NAVY S9523-AN-MMM-010, 5, November, 2009 are updated as follows:

1. File this sheet in front of the manual for reference.
2. The primary purpose of this change is to update the Repair Parts and Special Tools and Expendable/Durable Items List with revised items, part numbers, and NSNs.
3. Marine Corps TM number and PCN added to the manual.
4. New or updated text is indicated by a vertical bar in the outer margin of the page. Changed items in RPSTL are denoted by an asterisk (*) next to the changed item.
5. Remove old pages and insert new pages as indicated below:

Remove Pages	Insert Pages
Cover	Cover
a through j	a through j
A through B	A through B
i through x	i through x
DA Forms 2028	DA Forms 2028

6. Replace the following work packages with their revised version:

Work Package Number	Work Package Number	Work Package Number
WP 0001	WP 0072	WP 0077
WP 0068	WP 0073	WP 0078
WP 0069	WP0074	WP 0079
WP 0070	WP 0075	WP 0082
WP 0071	WP 0076	WP 0083

By Order of the Secretary of the Army:

RAYMOND T. ODIERNO
General, United States Army
Chief of Staff

Official:

JOYCE E. MORROW
Administrative Assistant to the
Secretary of the Army
1231001

By Order of the Commandant of the Marine Corps:

M.A. MANNING
Program Manager, Infantry
Combat Equipment
Quantico, VA 22134

By Order of the Secretary of the Navy:

KEVIN M. MCCOY
Vice Admiral, United States Navy
Commander, Naval Sea System
Command

Army Distribution:

To be distributed in accordance with the initial distribution number (IDN) 280911 requirements for TM 3-4230-238-23&P.

Marine Corps Distribution:

To be distributed in accordance with PCN 184 121121 01.

INSERT LATEST UPDATED PAGES / WORK PACKAGES. DESTROY SUPERSEDED DATA.

LIST OF EFFECTIVE PAGES / WORK PACKAGES

NOTE: Zero in the “Change No.” column indicates an original page or work package.

Date of issue for the original manual and changed pages / work packages are:

Original 5 November 2009

Change 1 31 December 2012

TOTAL NUMBER OF PAGES FOR FRONT AND REAR MATTER IS 40 AND TOTAL NUMBER OF WORK PACKAGES IS 84 CONSISTING OF THE FOLLOWING:

Page / WP No.	Change No.	Page / WP No.	Change No.
Front Cover	1		
Blank	1	WP 0029 (4 pgs)	0
Warning summary (10 pgs)	1	WP 0030 (6 pgs)	0
Title Block (i)	1	WP 0031 (2 pgs)	0
Table of Contents (ii-vi)	1	WP 0032 (6 pgs)	0
How to Use this Manual (vii-ix)	1	WP 0033 (4 pgs)	0
Blank (x)	1	WP 0034 (6 pgs)	0
Chp 1 title page	0	WP 0035 (10 pgs)	0
Blank	0	WP 0036 (6 pgs)	0
WP 0001 (6 pgs)	1	WP 0037 (2 pgs)	0
WP 0002 (12 pgs)	0	WP 0038 (2 pgs)	0
WP 0003 (4 pgs)	0	WP 0039 (2 pgs)	0
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WP 0008 (6 pgs)	0	WP 0048 (4 pgs)	0
WP 0009 (2 pgs)	0	WP 0049 (10 pgs)	0
WP 0010 (14 pgs)	0	WP 0050 (10 pgs)	0
WP 0011 (8 pgs)	0	WP 0051 (4 pgs)	0
WP 0012 (2 pgs)	0	WP 0052 (2 pgs)	0
WP 0013 (6 pgs)	0	WP 0053 (4 pgs)	0
WP 0014 (4 pgs)	0	WP 0053.1 (4 pgs)	0
WP 0015 (4 pgs)	0	WP 0054 (2 pgs)	0
WP 0016 (4 pgs)	0	WP 0055 (2 pgs)	0
WP 0017 (2 pgs)	0	WP 0056 (2 pgs)	0
WP 0018 (2 pgs)	0	WP 0057 (4 pgs)	0
WP 0019 (2 pgs)	0	WP 0058 (2 pgs)	0
WP 0020 (2 pgs)	0	WP 0059 (4 pgs)	0
WP 0021 (6 pgs)	0	WP 0060 (4 pgs)	0
WP 0022 (2 pgs)	0	WP 0061 (4 pgs)	0
WP 0023 (8 pgs)	0	WP 0062 (4 pgs)	0
WP 0024 (6 pgs)	0	WP 0063 (4 pgs)	0
WP 0025 (12 pgs)	0	WP 0064 (2 pgs)	0
WP 0026 (10 pgs)	0	WP 0065 (2 pgs)	0
WP 0027 (4 pgs)	0	WP 0066 (10 pgs)	0
WP 0028 (4 pgs)	0	WP 0067 (12 pgs)	0

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Chp 4 title page	0		
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WP 0068 (8 pgs)	1		
WP 0069 (8 pgs)	1		
WP 0070 (6 pgs)	1		
WP 0071 (18 pgs)	1		
WP 0072 (8 pgs)	1		
WP 0073 (6 pgs)	1		
WP 0074 (8 pgs)	1		
WP 0075 (24 pgs)	1		
WP 0076 (6 pgs)	1		
WP 0077 (8 pgs)	1		
WP 0078 (4 pgs)	1		
WP 0079 (6 pgs)	1		
Chp 5 title page	0		
Blank	0		
WP 0080 (2 pgs)	0		
WP 0081 (4 pgs)	0		
WP 0082 (4 pgs)	1		
WP 0083 (2 pgs)	1		
WP 0084 (8 pgs)	0		
INDEX-1-INDEX-5	0		
Blank	0		
Foldout Page-1-Foldout Page-3	0		
Inside back cover	0		
Back cover	1		

HEADQUARTERS, DEPARTMENTS OF THE ARMY AND NAVY
HEADQUARTERS, MARINE CORPS
Washington, D.C., 5 November 2009

TECHNICAL MANUAL

FIELD MAINTENANCE MANUAL INCLUDING REPAIR PARTS AND SPECIAL TOOLS LIST FOR DECONTAMINATING APPARATUS: JOINT SERVICE TRANSPORTABLE SMALL SCALE, M26 NSN 4230-01-555-0686 (EIC: ZJ4)

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TABLE OF CONTENTS

WP Sequence No.

Page No.

How To Use This Manual vii

Chapter 1 - General Information, Equipment Description and Theory of Operation for Decontaminating Apparatus: Joint Service Transportable Small Scale, M26

General Information ..... WP 0001

Equipment Description and Data ..... WP 0002

Table 1. Applicator Module Left Side Major Components 0002-3

Table 2. Applicator Module Right Side Major Components 0002-4

Table 3. Applicator Module Front Side Major Components 0002-5

Table 4. Applicator Module Major Components 0002-6

Table 5. Applicator Module Assembly 0002-10

Table 6. Accessory Kit 0002-11

Table 7. 3,000 Gallon Water Tank 0002-11

Theory of Operation ..... WP 0003

Chapter 2 - Field Troubleshooting Procedures for Decontaminating Apparatus: Joint Service Transportable Small Scale, M26

Master Malfunction/Symptom Index ..... WP 0004

Field Maintenance Troubleshooting Procedures ..... WP 0005

Table 1. Field Maintenance Troubleshooting Procedures 0005-1

Table 2. Field Maintenance Troubleshooting Procedures for AAL 0005-8

Chapter 3 – Field Maintenance Instructions for Decontaminating Apparatus: Joint Service Transportable Small Scale, M26

Service Upon Receipt ..... WP 0006

Preventive Maintenance Checks and Services (PMCS) Introduction ..... WP 0007

Preventive Maintenance Checks and Services (PMCS) and Lubrication Services ..... WP 0008

Table 1. Field Maintenance Preventive Maintenance Checks and Services 0008-1

Table 2. Field Maintenance Preventive Maintenance Check and Services for AAL 0008-6

Changing Water Pump Oil ..... WP 0009

Water Pump and Water Pump Clutch Assembly Replacement ..... WP 0010

TABLE OF CONTENTS

WP Sequence No.

Page No.

Water Pump V-Belt and Blower V-Belt Adjustment/Replacement ..... WP 0011
Water Pressure Gauge Replacement ..... WP 0012
High-Pressure Input and Output Hose Replacement ..... WP 0013
Safety Valve Testing and Replacement ..... WP 0014
Safety System Replacement ..... WP 0015
Pulsation Damper Testing and Replacement ..... WP 0016
Water Pump Sight Glass Replacement ..... WP 0017
Water Pump Check Valve Cleaning/Replacement ..... WP 0018
Water Pump Valve Cleaning and Replacement ..... WP 0019
Water Pump Filler/Vent Mounting Gasket Replacement ..... WP 0020
Blower Unit Replacement ..... WP 0021
Burner Unit Cloth Collar Replacement ..... WP 0022
Burner Fuel Pump and Fuel Pump Coupling Replacement and Fuel Hose Replacement ..... WP 0023
Blower Unit Damper Spring Replacement ..... WP 0024
Battery Service, Testing, Cable/Wiring, and Terminal Connector Replacement ... WP 0025
Control Box Replacement ..... WP 0026
Control Panel Light Replacement ..... WP 0027
Starter, Control, Ignition and Chemistry Pump Fuse Replacement ..... WP 0028
Table 1. Fuses in Control Box 0028-2
Electrical Relay Replacement ..... WP 0029
Table 1. Relay Locations in Control Box 0029-2
Selector Switch Inspection and Replacement ..... WP 0030
Hour Meter Replacement ..... WP 0031
Pre-heater Oil and Air Switches Replacement ..... WP 0032
Burner Control Circuit Breaker Replacement ..... WP 0033
Burner Rectifier Replacement ..... WP 0034
Temperature Gauge Functional Test and Gauge/Thermostat Replacement ..... WP 0035
Charging System Regulator Test and Replacement ..... WP 0036
Calcium Inhibitor Filter Replacement ..... WP 0037
High-Pressure Burner Outlet Replacement ..... WP 0038
Calcium Inhibitor Injection Screen Cleaning/Replacement ..... WP 0039
Metering Valve Replacement ..... WP 0040

TABLE OF CONTENTS

WP Sequence No.

Page No.

Engine Fuel Supply Line Replacement ..... WP 0041
Low Fuel Sensor Replacement ..... WP 0042
Flow Heater Maintenance ..... WP 0043
Flow Heater Decalcifying Maintenance ..... WP 0044
Igniter Electrode Adjustment and Replacement ..... WP 0045
Burner Nozzle Cleaning and Replacement ..... WP 0046
Burner Photo Cell Cleaning/Inspection and Replacement ..... WP 0047
Burner Fuel Line Replacement ..... WP 0048
Flow Heater Replacement ..... WP 0049
Engine Replacement ..... WP 0050
Table 1. Applicator Module Component Locations ...0050-2
Change Engine Oil and Oil Filter Replacement ..... WP 0051
Oil Dipstick Replacement ..... WP 0052
Service Air Filter Assembly ..... WP 0053
Replace Air Filter Assembly ..... WP 0053.1
Fuel Filter Replacement ..... WP 0054
Bleeding Fuel System ..... WP 0055
Engine Valve Cover and Gasket Replacement ..... WP 0056
Engine Valve Clearance Check and Adjustment ..... WP 0057
Engine Cooling Fins Cleaning ..... WP 0058
Engine Fuel Pump Replacement ..... WP 0059
Starter Test and Replacement ..... WP 0060
Throttle Control Assembly Inspection and Replacement ..... WP 0061
Main Fuel Supply Line Replacement ..... WP 0062
Emergency Fuel Shutoff Valve Replacement ..... WP 0063
Exhaust Pipe Replacement ..... WP 0064
Handle Replacement ..... WP 0065
Maintenance of Shower Assembly ..... WP 0066
Preparation for Storage or Shipment ..... WP 0067

TABLE OF CONTENTS

WP Sequence No.

Page No.

Chapter 4 – Parts Information for Decontaminating Apparatus: Joint Service Transportable Small Scale, M26

Repair Parts and Special Tools List (RPSTL) M26 Introduction ..... WP 0068

Group 0101 Pump, Reciprocating (Water Pump)..... WP 0069

Group 0102 Fan, Centrifugal (Blower) ..... WP 0070

Group 0103 Electrical System (Control Box)..... WP 0071

Group 0104 Water Piping System ..... WP 0072

Group 0105 Fuel Piping Assembly..... WP 0073

Group 0106 Flow Heater ..... WP 0074

Group 0107 Diesel Engine ..... WP 0075

Group 0108 Frame Assembly..... WP 0076

Group 02 Accessory Kit..... WP 0077

National Stock Number Index..... WP 0078

Part Number Index ..... WP 0079

Chapter 5 – Supporting Information for Decontaminating Apparatus: Joint Service Transportable Small Scale, M26

References ..... WP 0080

Maintenance Allocation Chart (MAC) Introduction ..... WP 0081

Maintenance Allocation Chart..... WP 0082

Table 1. MAC for Decontaminating Apparatus: Joint Service Transportable Small Scale, M26.....0082-1

Table 2. MAC for 3000-Gallon Water Tank.....0082-2

Table 3. Tools and Test Equipment for the M26 0082-3

Table 4. Remarks for M26.....0082-3

Expendable and Durable Items List (EDIL) ..... WP 0083

Table 1. Expendable/Durable Items List (EDIL).....0083-2

Torque Limits..... WP 0084

Table 1. SAE Standard Torque Table 0084-4

Table 2. SAE Standard Torque Table 0084-5

Table 3. Metric Standard Torque Table.....0084-6

Table 4. Metric Standard Torque Table.....0084-7

Major Component Task Index..... INDEX-1

TABLE OF CONTENTS

WP Sequence No.

Page No.

Foldout Figures

FO 1. M26 Wiring Diagram (Sheet 1 of 3) FP-1

FO 2. M26 Wiring Diagram (Sheet 2 of 3) FP-2

FO 3. M26 Wiring Diagram (Sheet 3 of 3) FP-3

DA Form 2028

Authentication Page

HOW TO USE THIS MANUAL

GENERAL

This manual is provided as both a paper technical manual (TM) and as an electronic TM (ETM). It is provided as an ETM on EM 0045, which is a CD that can be requisitioned in the same way as a paper TM. This manual contains information about how to maintain the M26. The manual is divided into five chapters. This is a joint services technical manual. It contains certain features to improve the convenience of using this manual and increase the user's efficiency. These features include:

a. Accessing Information

Information is accessed by referring to the Table of Contents, located in the front of this manual, or by looking in the Major Component Task Index, located in the back of this manual.

b. Illustrations

Various methods are used to locate and repair components. Locator illustrations are used throughout the manual and illustrations are located within the Preventive Maintenance Checks and Services (PMCS) tables. In addition, exploded views and cut-away diagrams make the information in the manual easier to understand and follow.

c. Using This Manual

When using this manual, read and understand the entire maintenance action before performing the task. Also, read and understand all warnings, cautions and notes as well as general safety precautions that apply to the task to be performed. The warning summary will inform personnel of hazards associated with the equipment to be worked on. However, the summary is not all-inclusive and personnel should be aware at all times of hazardous conditions that may arise.

WORK PACKAGES

This TM has been organized using a concept called work packages (WPs). Each chapter contains a series of WPs rather than sections and paragraphs. Ideally, each WP is designed to stand alone as a complete module of information; however sometimes a WP will reference out to another WP in order to avoid copying the same information many times in the TM. For the ETM, these WPs make it easy to click to the exact information you need. The following explains some of the features of WPs that you should be aware of in order to help you understand the organization of the TM:

- Each WP is numbered sequentially throughout the TM using a four-digit number. Go to the table of contents and you will see that the very first WP is numbered "0001". The second WP is numbered "0002".
- A decimal point system is used whenever it might be necessary to add a new WP in between already-prepared WPs. For example if a new WP needed to be inserted between WP 0014 and WP 0015, the new WP would be numbered "0014.1".
- The WP number is located at the top of each WP page (similar to the paragraph numbers you have seen in other TMs). It is also located at the bottom of each WP page as part of the WP page number. For example, the page number for the first page of the second WP of this TM is: **0002-1**
- If you look at a few WPs you will notice that each WP starts with the number 1 as shown above. Each WP starts on a right hand page. This was done so you can remove a single WP from your paper TM if needed for a particular task.

HOW TO USE THIS MANUAL-CONTINUED

WORK PACKAGES — CONTINUED

- While using the TM, one WP may refer you to another WP (e.g. WP 0010 Refers to “Add Oil to Water Pump (WP 0009)”) Turn to the referenced WP, complete the requested task (you may need to flip through the WP to find the task.), then return to the original WP and continue with the task.

WARNINGS, CAUTIONS, AND NOTES

Warnings are provided where injury may occur to personnel on or near the system. These warnings are located immediately before any operating or maintenance task that applies and they are also summarized at the front of this TM. Warnings are preceded by the word WARNING as shown below:

WARNING

HIGH PRESSURE

The high pressure stream of fluid produced can pierce skin and its underlying tissues, leading to serious injury. Do not direct discharge at anyone.

Cautions are provided where equipment may be damaged but no personal injury should result. Cautions are preceded by the word CAUTION as shown below:

CAUTION

Follow all cleaning and lubrication instructions carefully; failure to do so can result in damage to equipment.

Notes provide helpful information to operate or maintain the equipment, but there is no danger of equipment damage or personal injury. Notes are preceded by the word NOTE as shown below:

NOTE

Army PMCS is the equivalent to Navy’s Planned Maintenance System (PMS).

LOCATING MAJOR COMPONENTS

Refer to the Table of Contents located in the front of this manual. Find Chapter 1, *General Information*, *Equipment Description and Theory of Operation*. Under the chapter title you will find the work package titled *Equipment Description and Data*. Turn to the work package indicated. This work package will give a brief description of the major components, and show an illustration of what the component looks like and its location.

The Major Component Task Index, located in the back of this manual, contains a list of all maintenance work packages by major end item. Turn to the work package indicated to find the maintenance instructions for a particular end item component.

OPERATING PROCEDURES

To locate a particular operating procedure, refer to the Operator’s Manual, TM 3-4230-238-10.

HOW TO USE THIS MANUAL-CONTINUED

TROUBLESHOOTING PROCEDURES

To locate a particular troubleshooting procedure, turn to the Table of Contents in the front of this manual. Locate Chapter 2, *Field Maintenance Troubleshooting Procedures.* Under this section, find a work package titled *Master Malfunction/Symptom Index.* Turn to the work package indicated, which is the index for all malfunctions/symptoms and associated troubleshooting procedures. Look down the list until you find the appropriate malfunction/symptom for the problem you are trying to resolve. To the right of the malfunction/symptom will be a work package page number. Turn to the work package page number indicated and follow the steps to complete the troubleshooting procedure. The corrective action will indicate which maintenance procedure (work package) to reference for the repair of the malfunction/symptom. Follow the procedures indicated to complete the task. Identify the test equipment, tools, material/parts, equipment condition, and references required to perform the task listed at the top of the work package in the INITIAL SETUP.

There are six basic headings listed under INITIAL SETUP.

Test Equipment: Lists all test equipment (standard or special) required to troubleshoot, test, and inspect the equipment covered in this manual. The test equipment is identified with an item number and work package number from the *Maintenance Allocation Chart,* located in Chapter 5, *Supporting Information*.

Tools: Lists all tools (standard or special) required to perform the task. Tools are identified with an item number and work package number from the *Maintenance Allocation Chart,* located in Chapter 5, *Supporting Information*.

Materials/Parts: Lists all parts or materials necessary to perform the task. Expendable and durables are identified with an item number from the applicable work package located in Chapter 5, *Supporting Information*.

Personnel Required: Lists all personnel necessary to perform the task.

Equipment Condition: Notes the conditions that must exist before starting the task. The equipment condition will also include any prerequisite maintenance tasks to be performed with reference to the work package number or to the Technical Manual (TM) number.

References: Includes any other manuals necessary to complete the task. When there are no references listed, all steps necessary to complete the task are contained within this manual. A listing of reference materials is contained in the work package in Chapter 5, *Supporting Information*.

MAINTENANCE INSTRUCTIONS

To locate a maintenance procedure, open the manual to the Table of Contents located in the front of this manual. Locate the chapter, which pertains to your level of maintenance; Chapter 3 for *Field Maintenance Instructions*. Look down the list and find the maintenance procedure to be accomplished. On the right side of the maintenance procedure will be a work package number. Turn to the work package indicated. Before beginning the maintenance task, look through the procedure to familiarize yourself with the entire maintenance procedure. Identify the test equipment, tools, material/parts, equipment condition, and references required to perform the task listed at the top of the work package in the INITIAL SETUP.

REPAIR PARTS AND SPECIAL TOOLS LIST

Refer to Chapter 4, *Parts Information*, when requisitioning parts, special tools and equipment. Identify the mandatory repair parts required to perform the task listed at the top of the work package in the INITIAL SETUP. Using the work package and item numbers identified, you will be able to locate the SMR Code, NSN, CAGEC, the part number and quantity of items required for repair. Using the item number, locate the repair part within the associated figure.

CHAPTER 1

GENERAL INFORMATION, EQUIPMENT DESCRIPTION AND THEORY OF OPERATION FOR DECONTAMINATING APPARATUS: JOINT SERVICE TRANSPORTABLE SMALL SCALE, M26

FIELD MAINTENANCE
GENERAL INFORMATION

SCOPE

This manual contains descriptions and instructions for the M26 Transportable Small Scale Decontaminating Apparatus.

Type of Manual: Field Maintenance Manual Including Repair Parts and Special Tools List.

Model Number and Equipment Name: Decontaminating Apparatus: Joint Service Transportable Small Scale, M26.

Purpose of Equipment: The M26 covered by this manual is designed to be used by forward area personnel for cleaning and decontamination.

MAINTENANCE FORMS, RECORDS AND REPORTS

(A) Department of the Army forms and procedures used for equipment maintenance will be those prescribed by (as applicable) DA PAM 750-8, The Army Maintenance Management System (TAMMS) Users Manual; DA-PAM 738-751, Functional Users Manual for the Army Maintenance Management Systems – Aviation (TAMMS-A); or AR 700-138, Army Logistics Readiness and Sustainability.

(MC) Maintenance forms and records used by Marine Corps personnel are prescribed by TM 4700-15/1.

(N) Navy users should refer to their service directives to determine applicable maintenance forms and records to be used.

REPORTING EQUIPMENT IMPROVEMENT RECOMMENDATIONS (EIR)

(A) If your M26 needs improvement, let us know. Send us an EIR. You, the user, are the only one who can tell us what you do not like about your equipment. Let us know why you do not like the design or performance.

All non-Aviation/Missile EIRs and PQDRs must be submitted through the Product Data Reporting and Evaluation Program (PDREP) Web site. The PDREP site is: https://www.pdrep.csd.disa.mil/.

If you do not have internet access, you may submit your information using an SF 368 (Product Quality Deficiency Report). You can send your SF 368 using email, regular mail, or fax using the addresses/fax numbers specified in DA PAM 750-8, The Army Maintenance Management System (TAMMS) Users Manual. We will send you a reply.

(MC) The preferred method for submitting Product Quality Deficiency Reports (PQDRs) is through the Marine Corps Electronic Product Support Website at http://logcom.usmc.mil/pqdr/. If the above method is not available to you, put it on a Standard Form (SF) 368, Product Quality Deficiency Report, and mail it to us at: Marine Corps Logistics Command, PQDR Section (L15), 814 Radford Blvd., Ste 20330, Albany, GA 31704.

(N) PQDRs should be submitted through the Product Data Reporting and Evaluation Program (PDREP) Web site. The PDREP site is: https://www.pdrep.csd.disa.mil/. Product Quality Deficiency Reports (PQDRs) may be submitted to QDR.MECH.FCT@navy.mil or faxed to (717) 605-2372. The mailing address is: Department of the Navy, Code M85412, NAVSUP WEAPON SYSTEMS SUPPORT, 5450 Carlisle Pike, PO BOX 2020, Mechanicsburg, PA 17055-0788.

CORROSION PREVENTION AND CONTROL (CPC)

Corrosion Prevention and Control (CPC) of materiel is a continuing concern. It is important that any corrosion problems with this item be reported so that the problem can be corrected and improvements can be made to prevent the problem in future items.

Corrosion specifically occurs with metals. It is an electrochemical process that causes the degradation of metal. It is commonly caused by exposure to moisture, acids, bases, or salts. An example is the rusting of iron. Corrosion damage in metals can be seen, depending on the metal, as tarnishing, pitting, fogging, surface residue, and/or cracking.

Plastics, composites and rubbers can also degrade. Degradation is caused by thermal (heat), oxidation (oxygen), solvation (solvents) or photolytic (light, typically ultraviolet) processes. The most common exposures are excessive heat or light. Damage from these processes will appear as cracking, softening, swelling and/or breaking.

(A) SF Form 368, Product Quality Deficiency Report, should be submitted to the address specified in DA PAM 750-8, The Army Maintenance Management System (TAMMS) Users Manual.

(MC) Submit SF 368 in accordance with MCO 4855.10 to Commander, Attn: OPS Business Office L150, 814 Radford Blvd, STE 20320, Albany, GA 31704-0320 or email to: mbmatcompqdrstracking@matcom.usmc.mil.

(N) Submit SF 368 according to NAVSUPP-485 with copy to Commanding Officer, NSWCCD-SSES, Attn: Code 614, 5001 South Broad St., Philadelphia, PA 19112-1403.

DESTRUCTION OF MATERIEL TO PREVENT ENEMY USE

The procedures for destruction of materiel to prevent enemy use are contained in TM 43-0002-31, Destruction of Chemical Weapons and Defense Equipment to Prevent Enemy Use.

PREPARATION PROCEDURES FOR STORAGE OR SHIPMENT

Refer to work package (WP 0067) for instructions and general information.

CHEMICAL, BIOLOGICAL, RADIOLOGICAL, AND NUCLEAR INFORMATION RESOURCE CENTER (CBRN-IRC)

Do you have a problem or question about the equipment covered in this publication and need to talk to someone? There is a hotline at the CBRN-IRC that you can contact. The phone numbers are toll free from the USA and these lines are manned during our normal duty hours. If you call during our off duty hr you can leave a voice mail message and we will get back to you. Your e-mail or facsimile (FAX) message can be sent at any time and will be handled during the next business day.

The numbers are:

TOLL FREE	800-831-4408
DSN	793-7349
COMMERCIAL	309-782-7349
FAX (DSN)	793-7162
FAX (COMMERCIAL)	309-782-7162
E-MAIL	cbrn.irc@us.army.mil

NAVY 311 (ANCHOR DESK)

For assistance, Naval Forces may contact Navy 311 (formerly known as the Anchor Desk or Distance Support) via the web (http://www.anchordesk.navy.mil/) and via the toll free number (1-877-4-1-TOUCH [86824]). Navy 311 can provide answers to questions about systems and equipment, quality of life, personnel, supply and logistics, and installations and facilities.

NOMENCLATURE CROSS-REFERENCE LIST

Common Name	Official Nomenclature
Air Filter	Filter, element intake
Air Filter Assembly	Air Cleaner, intake
Battery Protective Cover	Shield, battery
Blower Assembly	Fan, Centrifugal
Burner Control Circuit Breaker	Relay, Thermal
Burner Fuel Line	Pipe, Bent Metallic
Burner Photo Cell	Photo Meter Flame
Burner Rectifier	Inverter, Power
Cable Ties	Strap, Tiedown electrical
Calcium Inhibitor Filter	Filter, Fluid
Calcium Inhibitor Hose	Tubing, Nonmetalic
Calcium Inhibitor Injection Screen	Restrictor, Fluid
Check Valve	Valve, Safety Relief
Cloth Collar	Boot, Dust
Control Box	Electrical Assembly
Copper Gasket	Washer
Coupling	Kupplung
Flow Heater	Heater, Water Liquid
Fuel Can	Can, military
Fuel Engine Supply Line	Fuel Pipe
Fuel Filter	Filter, fluid
Fuel Pump	Pump, fuel cam
Fuel Sensor	Switch, Liquid Level
High Pressure Burner Outlet	Tube Assembly, Metal
Hour Meter	Meter, Time
Igniter Electrode	Electrode
Injector Kit	Add On Kit
Light	Diode Light
Metering Valve	Valve, Safety Relief
Oil Dipstick	Gage, Rod Liquid Level
Oil Drain Plug	Plug, Pipe
Oil Level Indicator	Sight, Liquid Indicator
Photo Cell	Photometer flame
Pre-Cleaner	Bowl, sediment
Pulsation Damper	Tank, Pressure
Regulator	Regulator, Engine
Retaining Nut	Nut, Tube Coupling
Safety System	Switch Assembly
Sealing Cord	Packing Material
Shower Safety Valve	Parts Kit, Water Mix
Spring, Damper	Spring, Helical Torsion
Suction Filter Basket	Strainer
Switch, Selector	Switch, Rotary
Switch, Oil/Air	Switch, Push
Terminal Cover	Shield, Battery Post
Thermostat	Regulator, Temperature
Throttle Cable	Shaft, Drive Flexible
Throttle Lever	Lever
Valve Cover	Rocker Cover
Water Pressure Gauge	Gage Pressure, Dial
Water Pump	Pump, Reciprocating

NOMENCLATURE CROSS-REFERENCE LIST - CONTINUED

Common Name	Official Nomenclature
Water Pump Sight Glass	Indicator, Sight Liquid
Wire Tags	Tags, Marking
Wing Nut	Nut, self locking wing

LIST OF ABBREVIATIONS/ACRONYMS

Abbreviation/Acronym	Name
BII	Basic Issue Items
CBRN	Chemical, Biological, Radiological and Nuclear
CAGEC	Commercial and Government Entity Code
cm	Centimeters
COEI	Components of End Item
DA	Department of the Army
EIR	Equipment Improvement Recommendations
F	Fahrenheit
FM	Field Manual
ft	Foot/Feet
ft-lb	Foot Pounds
gal	Gallon/Gallons
GPM	Gallons Per Minute
hr	Hour/Hours
in.	Inch/Inches
in.-lb	Inch Pounds
kg	Kilogram/Kilograms
L/hr	Liters per Hour
L/min	Liters per Minute
L	Liter/Liters
lb	Pound/Pounds
MAC	Maintenance Allocation Chart
MHE	Material Handling Equipment
mm	Millimeter/Millimeters
NSN	National Stock Number
OP	Operating Procedures
oz	Ounce/Ounces
PMCS	Preventive Maintenance Checks and Services
PMS	Planned Maintenance System
PN	Part Number
PSI	Pounds Per Square Inch
RPM	Revolutions Per Minute
RPSTL	Repair Parts and Special Tools List
SMR	Source Maintenance and Recoverability
TAMMS	The Army Maintenance Management System
TM	Technical Manual
TMDE	Test, Measurement and Diagnostic Equipment
VDC	Volts Direct Current

QUALITY OF MATERIAL

Material used for replacement, repair or modification must meet the requirements of this manual. If quality of material requirements is not stated in this manual, the material must meet the requirements of the drawings, standards, specifications or approved engineering change proposals applicable to the subject equipment.

SAFETY, CARE AND HANDLING

M26 equipment operation should be carried out only by trained licensed personnel. These safety notices should be observed when operating the M26 to prevent personal injury or damage to equipment.

- The M26 operates with diesel and JP-8 fuels. Always observe safe handling of fuels. Avoid spilling fuel. Avoid skin contact with fuel. If accidental skin contact with fuel occurs, thoroughly clean the affected area immediately. Do not over fill fuel cans.
- Strictly adhere to Material Safety Data Sheets (MSDS). Always wear the specified protection equipment when handling chemicals used in equipment decontamination operations.
- During operations, the M26 produces high water pressures and high water temperatures. Always have a firm stance and grip when operating the hand spray gun and lance. The hot spray jet can cause severe injuries such as cuts and burns. Never direct the spray jet at other personnel.
- Hearing protection is required during all M26 operations. When operating the equipment in enclosed areas, the exhaust gases must be directed outside of the enclosed area through an exhaust duct.
- The applicator module's engine and flow heater exhaust are extremely hot. Avoid coming into contact with these components with exposed skin.
- Repair work on the electrical system should be carried out by qualified maintenance personnel only. If electrical work is required and the battery is attached, a second person will be present to disconnect the electrical supply in an emergency.

SUPPORTING INFORMATION FOR REPAIR PARTS, SPECIAL TOOLS, TMDE, AND SUPPORT EQUIPMENT

COMMON TOOLS AND EQUIPMENT

For authorized common tools and equipment, refer to the Modified Table of Organization and Equipment (MTOE), CTA 50-970, Expendable/Durable Items (Except: Medical, Class V, Repair Parts, and Heraldic Items), CTA 50-909, Field and Garrison Furnishings and Equipment or CTA 8-100, Army Medical Department Expendable/Durable Items, as applicable to your unit.

No specials tools or equipment are required to perform maintenance on the M26.

REPAIR PARTS

Repair parts are listed and illustrated in parts information work packages WP 0068 through WP 0079 of this manual.

END OF WORK PACKAGE

FIELD MAINTENANCE
EQUIPMENT DESCRIPTION AND DATA

EQUIPMENT CHARACTERISTICS, CAPABILITIES AND FEATURES

DECONTAMINATING APPARATUS: TRANSPORTABLE SMALL SCALE M26

The M26 provides the capability to conduct operational and thorough decontamination of medium-to-large mobile or fixed equipment and aircraft. The small-scale (M26) replaces the M-17 series. The small-scale system will require Material Handling Equipment (MHE) and will not require a dedicated vehicle.

APPLICATOR MODULE

The applicator module is a diesel-engine powered high-pressure cleaning and decontamination system that produces cold water; warm water, 120° F (50° C); and hot water, 175° F (80° C). It is primarily used for cleaning and decontamination purposes. Decontamination is carried out with water, hot water, hot soapy water or with a decontamination solution.

ACCESSORY KIT

The accessory kit consists of the accessory box and all accessories needed to operate the applicator module and components. The accessory kit is also equipped with components to carry out equipment decontamination operations.

SHOWER ASSEMBLY – FIELD SHOWER

Shower Assembly is used for showering personnel.

The shower is operated with the M26 applicator module.

The shower consists of an injector with a safety temperature valve, a water hose, and shower bar with corresponding nozzles.

3,000 GALLON WATER TANK (OPTIONAL)

The 3,000 gallon water tank is an open-top storage container capable of holding and dispensing 3,000 gallons of potable water. The upper portion of the tank includes a circular collar or lip to prevent spillage, filled with either air or foam. A protective cover is provided to prevent the accumulation of precipitation. The water tank is intended for use as a potable water storage container when quick storage facilities are needed and/or where permanent potable water storage facilities are not available. See TM 10-5340-237-12&P for setup and maintenance instructions

SAFETY DEVICES

The applicator module and components come equipped with several safety devices. These devices protect the operator as well as protecting the equipment.

1. Low Water Intake: If the water intake measures less than 53 gallons (201 L) per hour, the flow heater will not operate.

2. Safety System: Provides protection of overpressure when the spray wand/trigger assembly is not depressed, a nozzle is clogged, or the heating coil has excessive calcium/scale build-up.

3. Water Safety Valve: This valve prevents overpressure within the water pump system.

4. Pulsation Damper: Dampens the impulse of the water pump pistons (when the pistons are offset from each other and returning the opposite direction)

5. Emergency Fuel Shutoff Valve: A ball valve is used to shut the flow of fuel off from the fuel inlet side of the fuel injection pump. The engine shuts down in 10 - 15 seconds.

6. Safety Temperature Valve: Located on the shower assembly, this valve prevents water temperature in excess of 130 °F (54 °C) from flowing through the shower.

LOCATION AND DESCRIPTION OF MAJOR COMPONENTS

APPLICATOR MODULE

NOTE

Figures and Tables 1 thru 3 are repeated from the -10 as a courtesy for the maintainer. Figure and Table 4 provide detailed views of major components used or repaired during maintenance procedures in this Technical Manual.

The applicator module consists of the following major operating components, as shown in Figures 1-4.

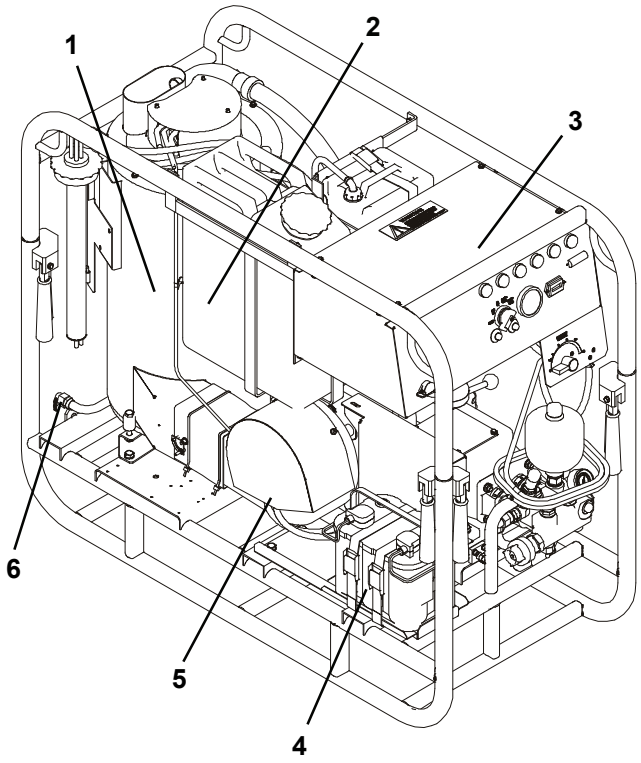


Figure 1. Applicator Module, Left Side.

Table 1. Applicator Module Left Side Major Components.

ITEM NO.	DESCRIPTION
1	Flow Heater. Used in conjunction with heating coil to control water temperature.
2	Fuel Can. Used to hold diesel fuel/JP-8 for operating the applicator module.
3	Electrical Control Box. Contains all fuses and electric devices that operate the applicator module.
4	Battery. Supplies the applicator module with electrical power.
5	Blower. Provides forced air for clean burning of fuel for the flow heater.
6	Water Outlet. Connection for high pressure hose.

LOCATION AND DESCRIPTION OF MAJOR COMPONENTS – CONTINUED

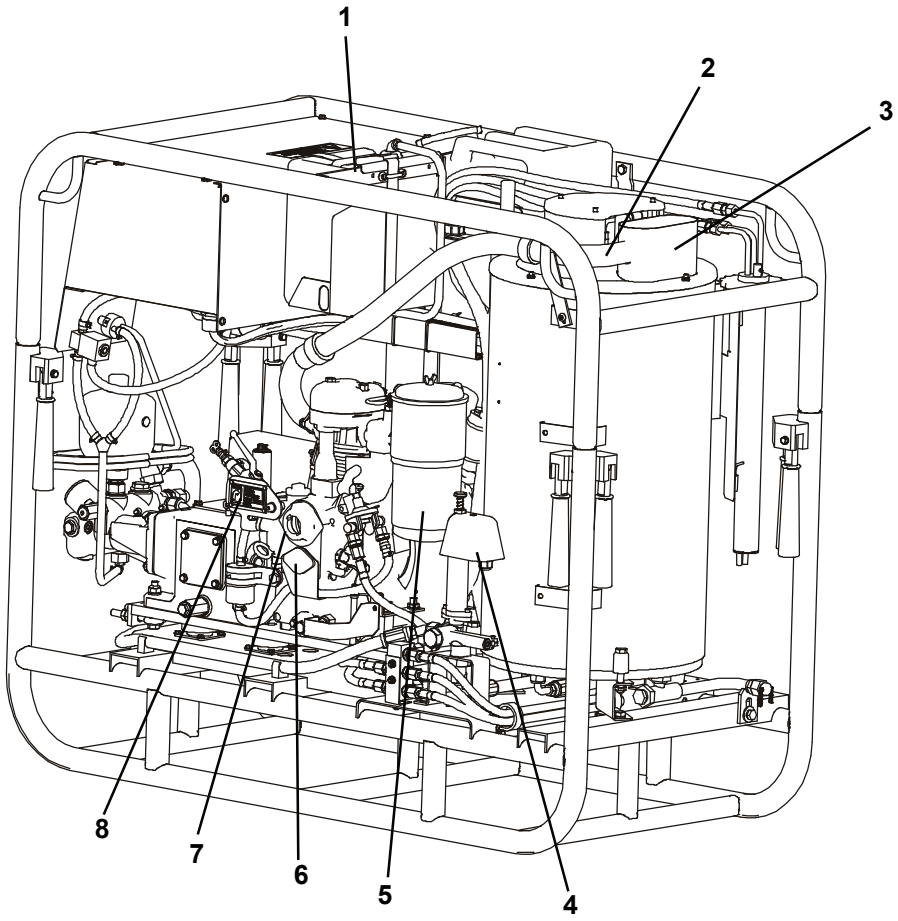


Figure 2. Applicator Module, Right Side.

Table 2. Applicator Module Right Side Major Components.

ITEM NO.	DESCRIPTION
1	Calcium Inhibitor Canister. Contains calcium inhibitor that prevents calcium deposits in the heating coil of flow heater.
2	Exhaust Pipe, Diesel Engine. Used to guide exhaust gases away from the engine.
3	Exhaust, Flow Heater. Used to guide heater exhaust gases away from the heater.
4	Safety System. Provides mechanical/electrical control of water pump and heater.
5	Air Filter Assembly, Engine. Located on the side of the engine, draws in filtered air.
6	Diesel Engine. Has an internal generator that charges the battery. The engine drives the water pump and the blower.
7	Engine Shaft. Use for manually starting the engine.
8	Emergency Fuel Shutoff Valve. Used to shut down the engine in case of an emergency.

LOCATION AND DESCRIPTION OF MAJOR COMPONENTS – CONTINUED

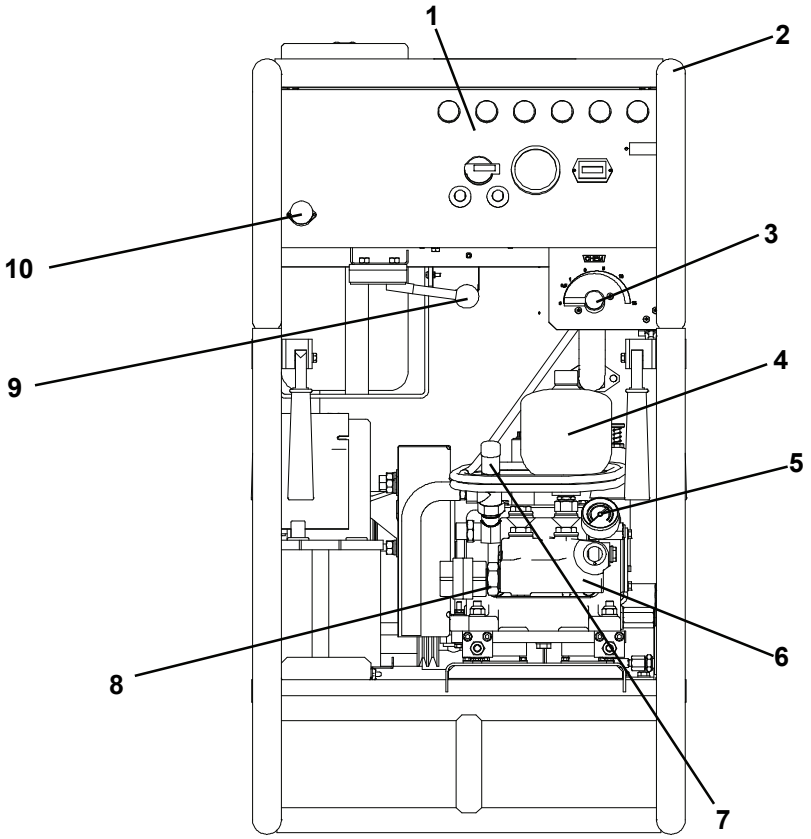


Figure 3. Applicator Module, Front Side.

Table 3. Applicator Module Front Side Major Components.

ITEM NO.	DESCRIPTION
1	Operator Panel. Contain controls and indicators used to operate the applicator module.
2	Frame. Houses the applicator module.
3	Metering Valve. Controls chemical or liquid soap intake.
4	Pulsation Damper. Stabilizes the flow and the pressure in water circuit with volumetric and dosing pumps.
5	Water Pressure Gage. Measures the internal water pressure.
6	Water Pump. Delivers pressurized water to the flow heater.
7	Safety Valve. Prevents overpressure in the high pressure pump.
8	Intake, Water Pump. Connection for intake of water.
9	Throttle Lever. Controls the engine speed.
10	Power Outlet. (Non-functional)

LOCATION AND DESCRIPTION OF MAJOR COMPONENTS – CONTINUED

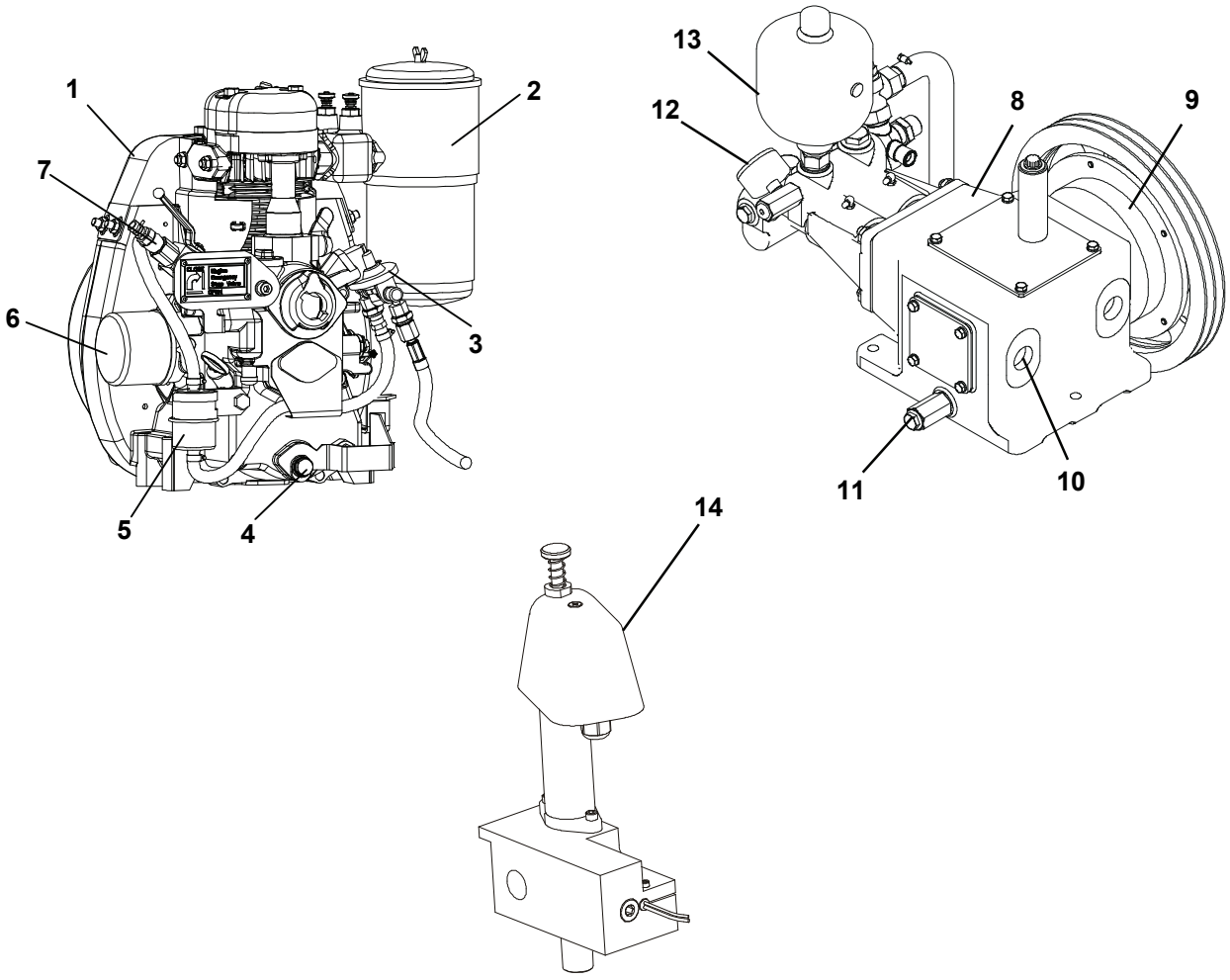


Figure 4. Applicator Module Major Components (Sheet 1 of 4).

Table 4. Applicator Module Major Components.

ITEM NO.	DESCRIPTION	ITEM NO.	DESCRIPTION
1	Engine	8	Water Pump
2	Air Filter	9	Water Pump Clutch
3	Fuel Pump	10	Oil Level Indicator
4	Oil Drain Plug	11	Oil Drain
5	Fuel Filter	12	Pressure Gauge
6	Oil Filter	13	Pulsation Damper
7	Emergency Fuel Shutoff Valve	14	Safety System

LOCATION AND DESCRIPTION OF MAJOR COMPONENTS – CONTINUED

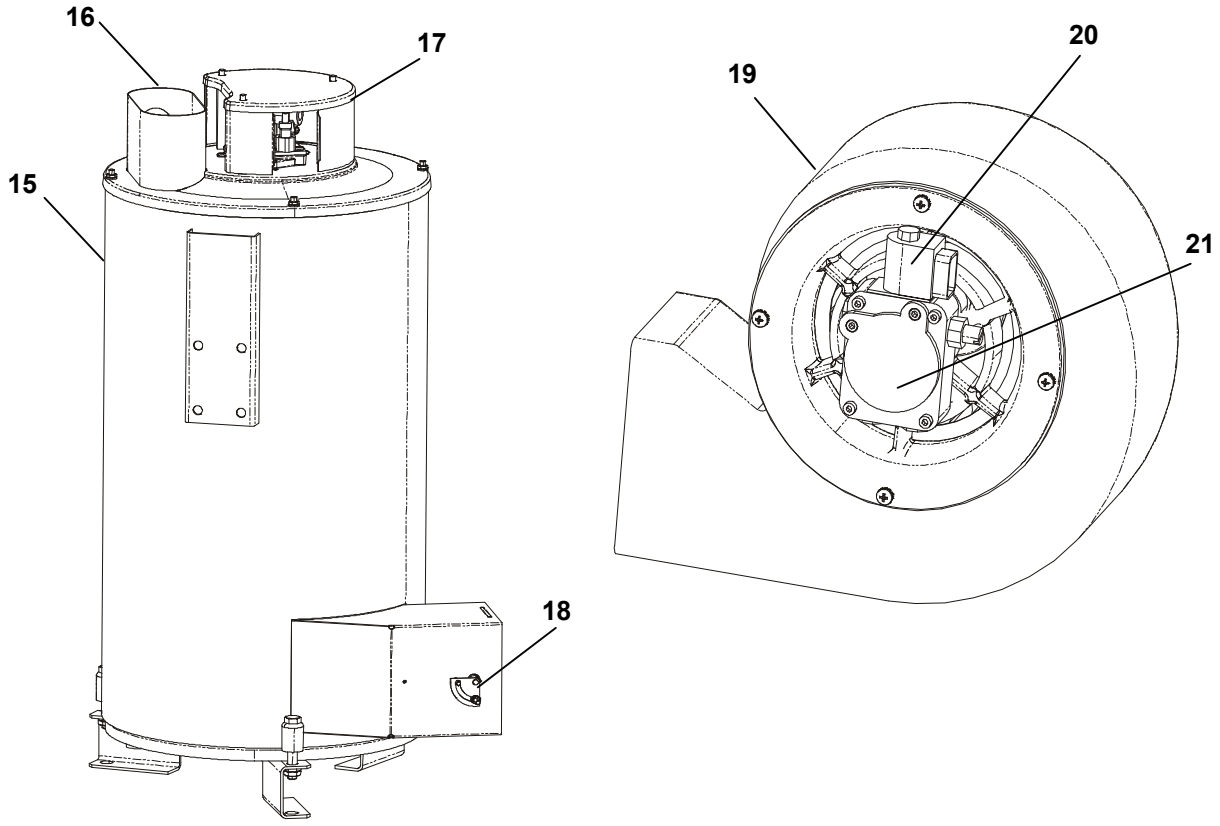


Figure 4. Applicator Module Major Components (Sheet 2 of 4).

Table 4. Applicator Module Major Components – Continued.

ITEM NO.	DESCRIPTION
15	Flow Heater (Contains Burner Assembly)
16	Engine/Heater Exhaust
17	Top Cover
18	Damper/Damper Spring
19	Blower Assembly
20	Fuel Pump Electrical Connector
21	Flow Heater Fuel Pump

LOCATION AND DESCRIPTION OF MAJOR COMPONENTS – CONTINUED

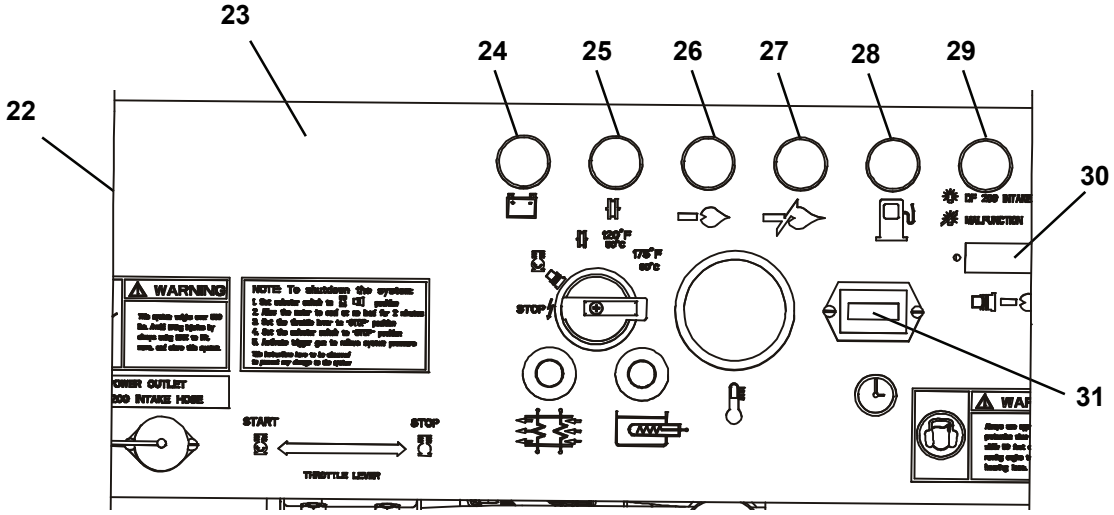


Figure 4. Control Panel Assembly (Sheet 3 of 4).

Table 4. Applicator Module Major Components – Continued.

ITEM NO.	DESCRIPTION
22	Control Box
23	Control Panel
24	Light, Battery Indicator. Red when switch is in electric start position. During operation, red indicates system not charging battery.
25	Light, Magnetic Clutch. White when water pump is operating.
26	Light, Burner Ignition. White when Flow heater is operating.
27	Light, Burner Circuit Breaker. Red to indicate Flow heater malfunction.
28	Light, Fuel Level Low. Yellow to indicate low fuel level in fuel can.
29	Light, Pre-Pressure Pump Indicator. (Non-functional)
30	Reset, Burner Malfunction. Circuit breaker for Flow heater ignition.
31	Hour Meter. Tracks accumulated operating hours.

LOCATION AND DESCRIPTION OF MAJOR COMPONENTS – CONTINUED

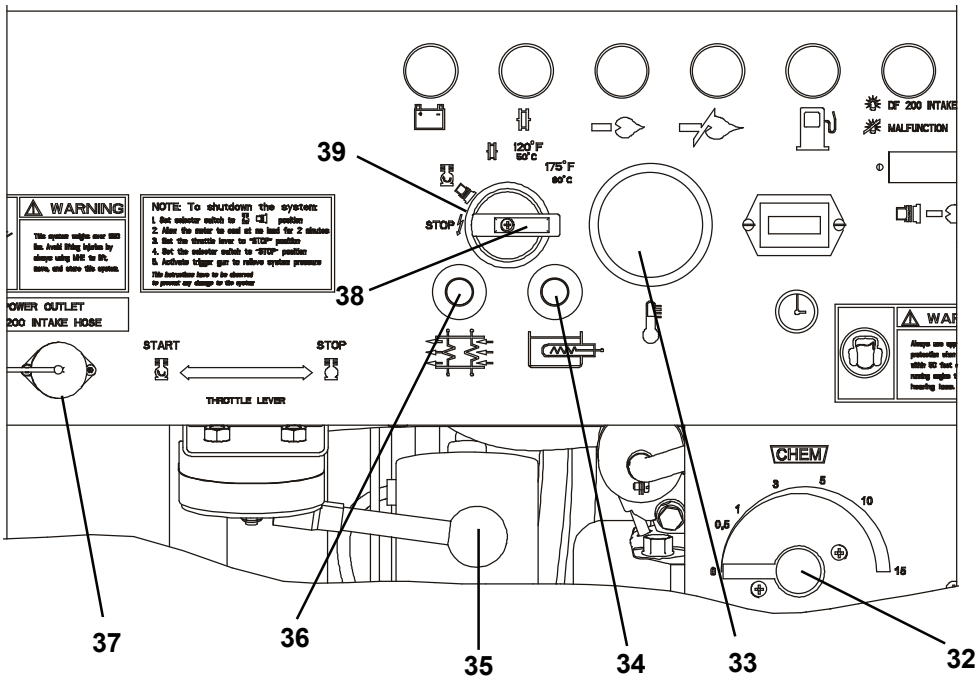


Figure 4. Control Panel Assembly (Sheet 4 of 4).

Table 4. Applicator Module Major Components – Continued.

ITEM NO.	DESCRIPTION
32	Metering Valve. Provides adjustable intake of soap or chemicals.
33	Water Temperature Gauge. Indicates water outlet temperature/water temperature control. Black Arrow – Indicates water temperature. Green Line – 120° F/50° C water temperature shut off point. Red Line - 175°/80° C water temperature shut off point.
34	Engine Oil Preheater Switch. Preheats engine oil (cold weather).
35	Throttle Lever. Controls engine speed/RPM.
36	Engine Air Inlet Preheater Switch. Preheats incoming air into engine (cold weather).
37	Power Outlet. (Non-functional)
38	Starter Button (Red). Enables electric engine start.
39	Selector Switch. Selects applicator module operating modes.

EQUIPMENT DATA

Tables 5 - 7 provide performance data pertaining to the operation and mechanical characteristics of the applicator module and major components.

Table 5. Applicator Module Assembly.

ITEM CHARACTERISTIC	DESCRIPTION
Engine	
Model	18B 437 0 115 M5
Type	Four Stroke
Combustion Principle	Direct injection
Compression Ratio	1:20
Lubrication Oil Filling	33.8 oz (1 L)
Net Weight	90 lb (41 kg)
Valve Clearance (Cold Engine) for Intake and Exhaust	0.004 in. (0.1 mm)
Operating Speed	
Maximum	3,600 RPM Max.
Idle	900 - 1,000 RPM Min.
Maximum Power	6.3 hp (4.7 kW)
Continuous Power	5.6 hp (4.2 kW)
Fuel Consumption	0.5 gal/hr (1.89 L/hr)
Noise Level	78 dB (4 A)
Water Pump	
Water Flow-Rate	383 gal/hr (1450 L/hr)
Type	Two Piston Pump
Operating Pressures	870 psi
Suction Height, Max.	17 ft (5.18 m)
Lubrication	Oil Bath
Lubricating Oil Capacity	67.6 oz. (2 L)
Flow-Thru Heater	
Model	KÄRCHER Upright Burner-System
Principle of Operation	Reverse Flow
Ignition	Electrical
Flame Sensor	Photo-Electrode
Flow Heater Performance	398.083 BTU
Fuel Consumption	3.3 gal/hr (12.49 L/hr)
PERFORMANCE DATA	
Applicator Module	
High Pressure Stage:	
Operating Pressure	870 psi
Flow Capacity	383 gal/hr (1449.81 L/hr)
Spray-jet Temperature (intake 60° F/15° C)	Cold Water or Warm Water With Max. 120 °F(50 °C) or 175 °F (80 °C)
Suction Height, Max.	17 ft (5.18 m)
Cleaning Agent Intake	0-16 gal/hr (0-60.57 L/hr)
Inlet Water Temperature, Max	120 °F (50 °C)
TECHNICAL DATA	
Length	49.2 in. (1.250 mm)
Width	22.60 in. (575 mm)
Height	49.90 in. (1039 mm)
Weight	562 lb (255 kg)

EQUIPMENT DATA – CONTINUED

Table 6. Accessory Kit.

ITEM CHARACTERISTIC	DESCRIPTION
Storage Case	
Length	51 in. (1.30 m)
Width	27 in. (0.685 m)
Height	21.5 in. (0.546 m)
Weight (Loaded)	217 lb (100 kg)

Table 7. 3,000 Gallon Water Tank (Optional).

ITEM CHARACTERISTIC	DESCRIPTION
Capacity	3,000 gal
Type	Fabric, Collapsible
Weight (Empty)	90 lb (40.82 kg) with cover 75 lb (34.02 kg) without cover
Height (Full)	60 in. (1.52 m)
Operating Temperature (Ambient)	Low: 32 °F (0 °C) High: 125 °F (52 °C)
Storage Temperature (Ambient)	Low: -25 °F (-32 °C) High: 160 °F (71 °C)

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
THEORY OF OPERATION

GENERAL

The M26 is a high-pressure cleaning system that is used for cleaning and decontamination purposes. The applicator module of this system produces high-pressure cold water (ambient temperature), warm water (120° F/50 °C), and hot water (175° F/80 °C). The accessory kit contains components used for cleaning and decontamination operations, the shower assembly and tools for performing operator level maintenance on the M26.

The M26 can be operated in above freezing and below freezing conditions only needing a water and fuel source. No external power is required. Operation may be conducted in the following two modes:

1. Decontamination of material and equipment using the hand spray gun and spray lances.
2. Providing showers for personnel using shower assembly.

NOTE

This diagram illustrates principles of operation only. It is not an exact representation of the equipment.

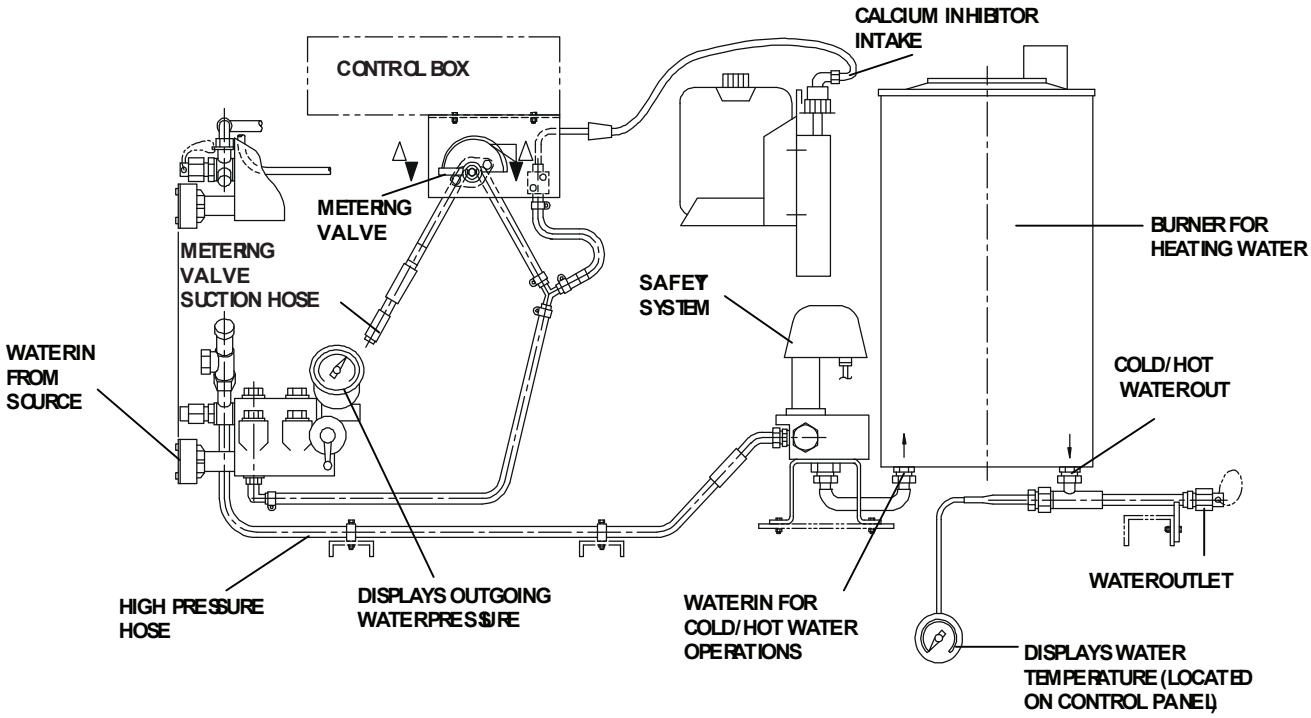


Figure 1. Functional Description of the M26.

CONTROL BOX THEORY OF OPERATION

The control box is an electrical/mechanical assembly that operates the M26. The operator panel on the control box contains indicators and switches that allow the operator to select and monitor applicator module operations. For more information about the control box functions, see Operator's Manual, WP 0004.

DIESEL ENGINE THEORY OF OPERATION

The diesel engine that powers the applicator module is a vertical, four-stroke, single cylinder, air-cooled engine. It develops 6.3 horsepower using a direct fuel injection system capable of using diesel fuels and is JP-8 compatible. The engine has the capacity of one L of SAE 15W40 engine oil and uses fuel at a rate of less than 0.5 gallons per hour (1.89 L/hr). Fuel for the engine is drawn from a fuel can.

The engine drives the water pump and the blower. The generator contained within the engine charges a 12-volt battery that supplies the M26 with electrical power. The engine is started with an electrical starter or by a hand crank.

FUEL PIPING SYSTEM THEORY OF OPERATION

Fuel for the engine is supplied from a 5.28 gallon (20 L) fuel can (fuel supply). The engine fuel pump delivers fuel from the fuel can to the engine. The flow heater fuel pump delivers fuel from the fuel can to the flow heater fuel nozzle. If the flow heater is switched on, the fuel flow heater pump delivers fuel from the fuel supply to the flow heater nozzle. The fuel is atomized by the nozzle, mixed with forced air and burned. Unused fuel from the engine and flow heater are returned through the fuel distribution block to the fuel can (fuel supply).

NOTE

This diagram illustrates principles of operation only. It is not an exact representation of the equipment.

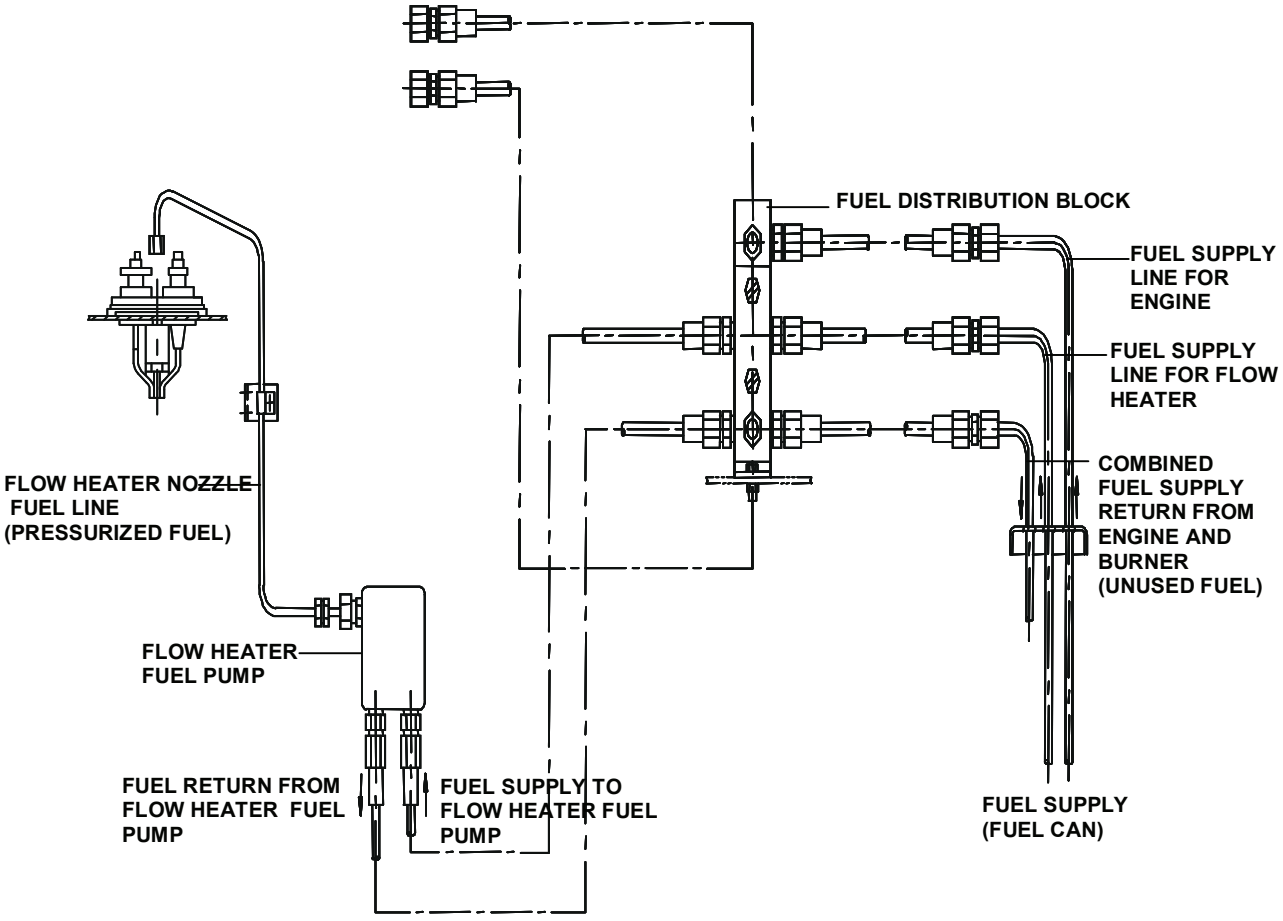

FUEL DISTRIBUTION BLOCK
FUEL SUPPLY LINE FOR ENGINE
FUEL SUPPLY LINE FOR FLOW HEATER
COMBINED FUEL SUPPLY RETURN FROM ENGINE AND BURNER (UNUSED FUEL)
FLOW HEATER NOZZLE FUEL LINE (PRESSURIZED FUEL)
FLOW HEATER FUEL PUMP
FUEL RETURN FROM FLOW HEATER FUEL PUMP
FUEL SUPPLY TO FLOW HEATER FUEL PUMP
FUEL SUPPLY (FUEL CAN)

Figure 2. Fuel Piping System.

FLOW HEATER THEORY OF OPERATION

The flow heater is an upright burner system that uses fuel supplied from the fuel can. Combustion gasses are exhausted out of the engine and flow heater exhaust system located on the top of the flow heater. The flow heater routes water through the heating coil heated by the flow heater brick. The flow heater unit produces up to 398,000 BTUs and uses less than 3.5 gallons (13.25 L) of fuel per hour. Forced air is provided by the blower that provides air for a clean burning of fuel. The applicator module also has a calcium inhibitor (water softener) system that is injected when in the warm and hot water modes. The calcium inhibitor reduces the buildup of scale deposits when heating water.

NOTE

This diagram illustrates principles of operation only. It is not an exact representation of the equipment.

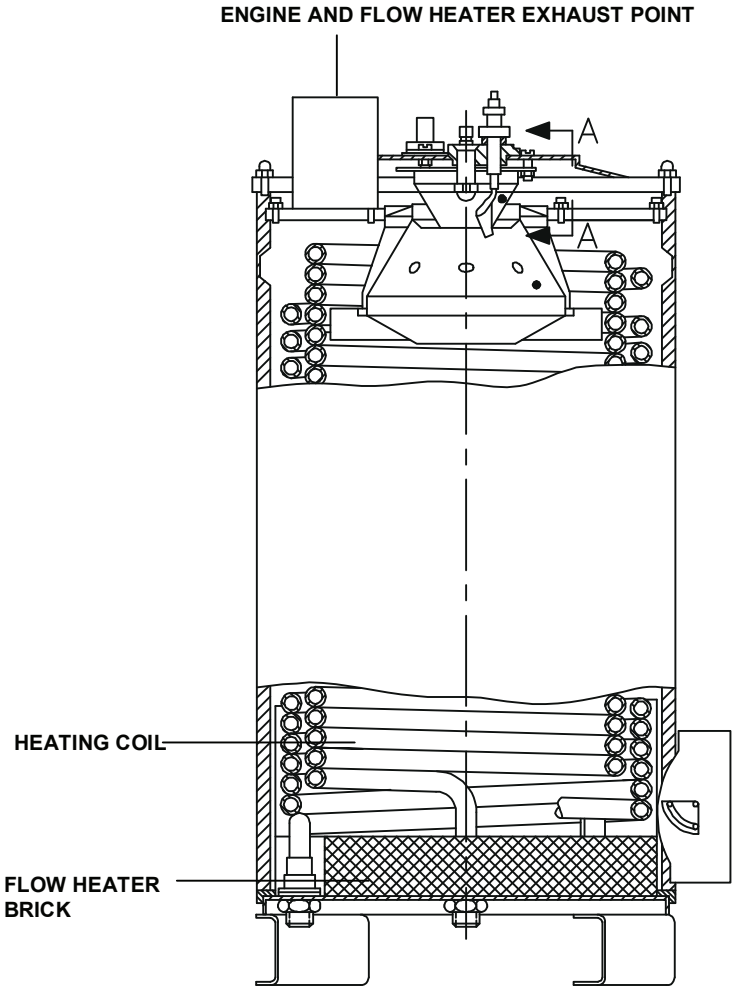


Figure 3. Flow Heater.

WATER PIPING SYSTEM THEORY OF OPERATION

The water piping system consists of the water pump which is a two-piston positive displacement pump, controlled by the pressure switch, and is continuously adjustable. The flow rate of the pump is 383 gallons per hour (1449 L/hr) with suction lift capability of 17 feet (5.18 m). The pump is internally lubricated using water pump oil with a capacity of two liters. The two pump pistons are lubricated at the two external grease fittings by the operator.

The water pump delivers the water by way of a pre-filter to the flow heater. A flow sensor within the safety system senses the amount of water flow. The blower within the flow heater provides the necessary combustion air. The heated water or the hot steam flows through the high-pressure hose to the hand spray gun.

NOTE

This diagram illustrates principles of operation only. It is not an exact representation of the equipment.

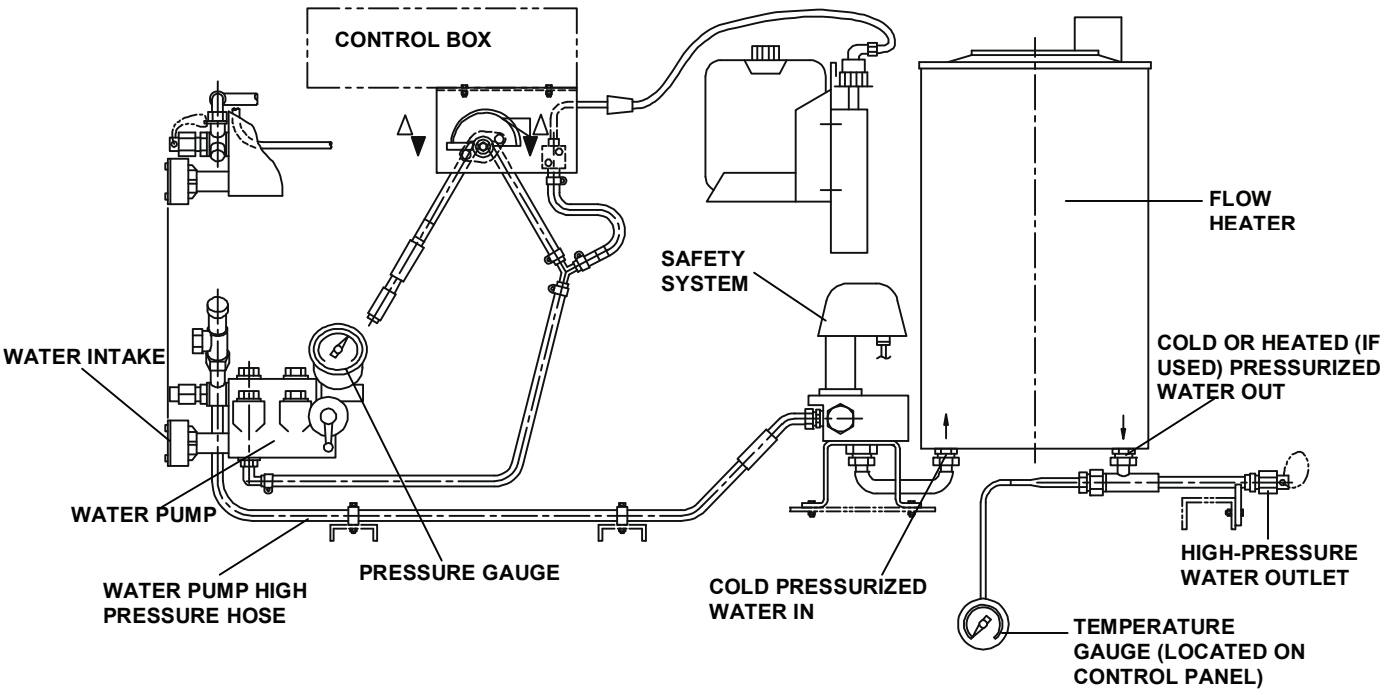


Figure 4. Water Piping System.

END OF TASK

END OF WORK PACKAGE

CHAPTER 2

FIELD TROUBLESHOOTING PROCEDURES FOR DECONTAMINATING APPARATUS: JOINT SERVICE TRANSPORTABLE SMALL SCALE, M26

FIELD MAINTENANCE
MASTER MALFUNCTION/SYMPTOM INDEX

MALFUNCTION/SYMPTOM **TROUBLESHOOTING PROCEDURE**

GENERAL

1. Engine will not start ..... WP 0005-1
2. Engine difficult to turn over ..... WP 0005-2
3. Starter does not turn over engine ..... WP 0005-2
4. Engine does not run properly or shuts off ..... WP 0005-3
5. Engine emits heavy black smoke ..... WP 0005-3
6. Engine is too warm ..... WP 0005-3
7. Engine knocks ..... WP 0005-3
8. Burner does not ignite or flame goes out during operation ..... WP 0005-4
9. Water pump knocks, pressure varies ..... WP 0005-5
10. Water pump does not engage ..... WP 0005-5
11. Heater does not achieve operating temperature ..... WP 0005-6
12. Water pump cycles off and on continuously ..... WP 0005-6
13. Calcium inhibitor is not drawn in ..... WP 0005-6
14. Water pump does not run - no water is pumped ..... WP 0005-7
15. Water pump safety valve leaks water ..... WP 0005-7
16. Shower Assembly safety valve will not stay in open position ..... WP 0005-8
17. Shower Assembly does not receive enough cold water during operation ..... WP 0005-8

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
TROUBLESHOOTING PROCEDURES

INITIAL SETUP:

Test Equipment
Not Applicable

Tools
Tool Kit, General Mechanic (WP 082, Item 2)

Personnel Required
Equipment Repairer/Mechanic

References

TM 3-4230-238-10	WP 0033	WP 0053
WP 0010	WP 0034	WP 0053.1
WP 0014	WP 0035	WP 0054
WP 0015	WP 0039	WP 0055
WP 0016	WP 0040	WP 0057
WP 0018	WP 0041	WP 0058
WP 0019	WP 0044	WP 0059
WP 0021	WP 0045	WP 0060
WP 0023	WP 0046	WP 0061
WP 0025	WP 0047	WP 0062
WP 0028	WP 0048	WP 0063
WP 0029	WP 0050	WP 0066
WP 0030	WP 0051	

Materials/Parts
Cloth, Cleaning (WP 083, Item 3)
Accessory Kit (WP 082, Item 1)
Pan, Drain (WP 083, Item 8)

Equipment Condition
Applicator module set on level ground

NOTE

Wiring diagrams are available in the back of the TM for troubleshooting of control box (Foldouts 1-3).

Table 1. Field Maintenance Troubleshooting Procedures.

SYMPTOM	TEST OR INSPECTION	CORRECTIVE ACTION
ENGINE WILL NOT START	1. Check position of selector switch.	1. Ensure the selector switch is in the engine operating position.
	2. Check for throttle lever operation (WP 0061). Observe throttle linkage on engine for operation.	2. Replace throttle cable and/or throttle lever (WP 0061).
	3. Check if fuel filter is clogged. No fuel coming out of filter.	3. If clogged, replace fuel filter (WP 0054).
	4. Check fuel flow from fuel pump outlet.	4. If no flow, replace fuel pump (WP 0059).

Table 1. Field Maintenance Troubleshooting Procedures – Continued.

SYMPTOM	TEST OR INSPECTION	CORRECTIVE ACTION
ENGINE WILL NOT START - CONTINUED	4a. Remove hex bolt, two copper washers, and fuel line fitting from outboard side of fuel pump. Drain fuel into drain pan.	
	4b. Operate fuel pump primer handle several times by pushing up and releasing.	
	4c. Observe for fuel flow.	
	5. Check fuel temperature by touching outside of fuel can.	5. If hot to touch, service fuel can (Operator's Manual, WP 0025).
	6. Check for air in fuel system.	6. Bleed fuel system (WP 0055).
	7. Check condition of engine fuel supply line & main fuel supply line.	7. Replace damaged fuel line (WP 0041 and/or WP 0062).
	8. Check engine decompression valve for operation:	8. If decompression valve does not engage, replace engine (WP 0050).
	8a. Engage decompression valve.	
	8b. With engine hand crank, rotate engine through cycle of revolutions to disengage decompression valve (8 full rotations).	
	9. Check for incorrect engine valve clearance (WP 0057).	9. If incorrect, adjust valve clearance as required (WP 0057).
ENGINE DIFFICULT TO TURN OVER	Check if M-26 is being operated in cold weather.	If operating in cold weather, check if oil is too thick. Change oil, using the correct viscosity (WP 0051).
STARTER DOES NOT TURN OVER ENGINE	1. Test if battery voltage is low or if no voltage is present (WP 0025).	1. If low or no voltage, replace battery (WP 0025).
	2. Visually check 25 AMP fuse. (WP 0028)	2. If burnt out replace fuse. (WP 0028).
	3. Inspect STARTER button (WP 0030).	3a. If defective, replace selector switch (WP 0030).
		3b. If not defective, replace starter relay (WP 0029).
	4. Check starter for operation.	4. Test and replace starter if necessary (WP 0060).

Table 1. Field Maintenance Troubleshooting Procedures – Continued.

SYMPTOM	TEST OR INSPECTION	CORRECTIVE ACTION
ENGINE DOES NOT RUN PROPERLY OR SHUTS OFF	1. Check fuel supply.	1. If low, service fuel can (Operator's Manual, WP 0025).
	2. Check if fuel filter is clogged (WP 0053).	2. If clogged, replace fuel filter (WP 0054).
	3. Inspect air filter for debris (WP 0053).	3. If dirty, service air filter (WP 0053). Replace air filter element if required (WP 0053.1).
	4. Check fuel can suction tube for debris.	4. If fuel can suction tube is clogged, clear debris (Operator's Manual, WP 0005).
	5. Check emergency fuel shutoff valve.	5. Place emergency fuel shutoff valve in open position (Operator's Manual, WP 0012). If defective, replace valve (WP 0063).
	6. Check or visually inspect the venting screw.	6a. Tighten venting screw. 6b. Bleed fuel system (WP 0055). 6c. If engine still does not operate properly, replace engine (WP 0050).
ENGINE EMITS HEAVY BLACK SMOKE	1. Check engine oil level.	1. If over the "MAX" marking on the dipstick, drain oil to the "MAX" marking (WP 0051).
	2. Inspect air filter for debris.	2. Clean or replace air filter element (WP 0053).
ENGINE IS TOO WARM	1. Check engine cooling fins for debris or obstructions.	1. If dirty, clean engine cooling fins (WP 0058).
	2. Check engine air flow at engine cylinder head cooling fins.	2. If there is no air flow, replace engine (WP 0050).
ENGINE KNOCKS	1. Check fuel can for use of gasoline instead of diesel fuel.	1a. If gasoline was used, dispose of gasoline IAW local OP. Service fuel can using diesel fuel/JP-8 (Operator's Manual, WP 0025). 1b. If gasoline was used, bleed fuel system (WP 0055). 2. If knocking persists, replace engine (WP 0050).

Table 1. Field Maintenance Troubleshooting Procedures – Continued.

SYMPTOM	TEST OR INSPECTION	CORRECTIVE ACTION
BURNER DOES NOT IGNITE OR FLAME GOES OUT DURING OPERATION	1. Check if burner control circuit breaker has tripped.	1. If burner control circuit breaker has tripped, reset circuit breaker. If circuit breaker continuously trips replace burner control circuit breaker (WP 0033).
	2. Check for igniter spark (WP 0047).	2a. If no spark is visible clean burner photo cell sight glass (WP 0047) and recheck for ignition spark.
		2b. If no spark is visible check ignition fuse. If defective, replace 2 AMP fuse (WP 0028).
		2c. If spark still not visible, adjust or replace igniter electrodes (WP 0045).
		2d. If spark is still not visible, replace burner rectifier (WP 0034).
	3. Check if burner photocell is oily or sooty.	3a. If oily or sooty, clean burner photo cell (WP 0047).
		3b. If symptom not corrected, replace burner control relay (WP 0029).
	4. Check if burner nozzle fuel screen is dirty or damaged.	4a. If dirty, clean nozzle screen (WP 0046).
		4b. If damaged, replace burner nozzle (WP 0046).
	5. Check burner nozzle tip for damage or dripping fuel.	Perform the following steps:
		5a. If damaged or dripping fuel, replace burner nozzle (WP 0046).
		5b. If not damaged, clean burner nozzle tip (WP 0046).
	6. Check burner fuel pump operation.	6a. If no fuel flows, replace burner fuel pump (WP 0023).
	6a. Loosen burner fuel line at burner fuel pump.	6b. If fuel lines are damaged or leaking, replace burner fuel lines (WP 0048).
	6b. Start system.	

Table 1. Field Maintenance Troubleshooting Procedures – Continued.

SYMPTOM	TEST OR INSPECTION	CORRECTIVE ACTION
BURNER DOES NOT IGNITE OR FLAME GOES OUT DURING OPERATION - CONTINUED	6c. Place selector switch in burner mode. Fuel should flow. 6d. Check fuel lines for damage.	
	7. Inspect fuel pump coupling for damage.	7a. Replace burner fuel pump coupling if damaged or broken (WP 0023). 7b. If during inspection blower fan is damaged, replace blower (WP 0021).
	8. Visual leak in metering valve reported by Operator.	8. Replace metering valve (WP 0040).
WATER PUMP KNOCKS, PRESSURE VARIES	1. Check pulsation damper pressure (WP 0016). 2. Check if water pump valves are damaged or obstructed.	1. If low, replace pulsation damper (WP 0016). 2a. Clean or replace water pump valves (WP 0019). 2b. If water pump still does not work properly, replace water pump (WP 0010).
WATER PUMP DOES NOT ENGAGE	1. Check for adequate water supply.	1. Provide adequate water supply.
	2. Check water suction hose for damage.	2. If damaged, replace water suction hose
	3. Check if suction basket is damaged.	3. If damaged, replace suction basket.
	4. Check if line filter is clogged.	4. If clogged, remove line filter and clean (Operator's Manual, WP 0022).
	5. Check if line filter is damaged.	5a. If damaged, replace line filter (Operator's Manual, WP 0022). 5b. If water pump, still inoperative, replace safety system (WP 0015).
	6. Check if valve plates in water pump are leaking, dirty, or damaged.	6. Clean or replace valve plates as required (WP 0019).

Table 1. Field Maintenance Troubleshooting Procedures – Continued.

SYMPTOM	TEST OR INSPECTION	CORRECTIVE ACTION
WATER PUMP DOES NOT ENGAGE - CONTINUED	7. Check if water shortage relay is operating: 7a. With applicator module running, turn selector switch from start to pump to burner position. 7b. Locate water shortage relay (WP 0029, Table 1). 7c. Touch water shortage relay. Switch to pump position then back to burner position. Feel for relay activating and deactivating as selector switch positions change.	7. If relay is inoperative, replace water shortage relay (WP 0029).
HEATER DOES NOT ACHIEVE OPERATING TEMPERATURE	1. Test safety valve (WP 0014). 2. Check if line filter screen is clogged. 3. Observe reading on temperature gauge.	1. If continuous flow of water, replace safety valve (WP 0014). 2. If clogged, remove and either clean or replace line filter (Operator's Manual, WP 0022). 3. If temperature gauge reading indicates little or no increase in water temperature when burner is operating continuously for 2-3 minutes, replace thermostat (WP 0035).
WATER PUMP CYCLES OFF AND ON CONTINUOUSLY	1. Check if applicator module has over 300 operating hours. 2. Observe pressure gauge by operating applicator module. On/off points on pressure gauge should be 0 PSI (on) and 1015 PSI (off).	1. If over 300 hours, decalcify the flow heater (WP 0044). Note: If there is any doubt that flow heater has been decalcified, decalcify flow heater. 2. If pump comes on above 300 PSI and goes off above 1,100 PSI, replace the safety system (WP 0015).
CALCIUM INHIBITOR IS NOT DRAWN IN	1. Check if calcium inhibitor screen is clogged or damaged	1. If clogged, clean. If damaged, replace calcium inhibitor screen (WP 0039).

Table 1. Field Maintenance Troubleshooting Procedures – Continued.

SYMPTOM	TEST OR INSPECTION	CORRECTIVE ACTION
CALCIUM INHIBITOR IS NOT DRAWN IN - CONTINUED	2. Check if valve at chemical intake of water pump is clogged. 3. Check if calcium inhibitor relay (WP 0029, Table 1) is operating. Turn selector switch from start to pump to burner position. Audible click should be heard.	2. If clogged, clean or replace the check valve (WP 0018). 3. If inoperative, replace calcium inhibitor relay (WP 0029).
WATER PUMP DOES NOT RUN - NO WATER IS PUMPED	1. Check if 20 AMP fuse is blown. 2a. With engine off, check if clutch relay is operating. Turn selector switch from stop to pump position. Audible click should be heard. 2b. Check if water pump clutch is engaging. Do not start the applicator module. Turn selector switch from engine start position to pump position. A metallic sound from water pump clutch should be heard. 3. Check selector switch position.	1. If blown, replace 20 AMP fuse in electrical control box (WP 0028). 2a. If no audible click is heard, replace clutch relay (WP 0029). 2b. If clutch does not engage, replace water pump clutch (WP 0010). 3. Perform all of the following steps: a. Set selector switch to engine START position. b. Release pressure by activating the trigger gun. c. Press and release reset button on the water pressure safety switch. Button should come up and stay up. d. Set selector switch back to PUMP position. e. Operate applicator module (Operator's Manual, WP 0007). f. If applicator module does not operate, replace safety system (WP 0015).
WATER PUMP SAFETY VALVE LEAKS WATER	Check for debris in safety valve.	1. Remove safety valve (WP 0014) and inspect for debris.

Table 1. Field Maintenance Troubleshooting Procedures –Continued.

SYMPTOM	TEST OR INSPECTION	CORRECTIVE ACTION
WATER PUMP SAFETY VALVE LEAKS WATER - CONTINUED		2. Remove debris. Replace safety valve if unable to remove debris (WP 0014). 3. Test safety valve for proper operation (WP 0014).

Table 2. Field Maintenance Troubleshooting Procedures for Shower Assembly.

SHOWER ASSEMBLY SAFETY VALVE WILL NOT STAY IN OPEN POSITION	Check water temperature gauge on applicator module.	1. If above 130 °F, reduce water temperature. 2. If safety valve fails to stay open after reducing water temperature, replace safety valve (WP 0066).
SHOWER ASSSEMBLY DOES NOT RECEIVE ENOUGH COLD WATER DURING OPERATION	1. Check if injector kit suction filter is clogged. 2. Check injector kit suction hose for damage.	1. Clean clogged suction filter (Operator's Manual, WP 0028). 2. If hose is damaged, replace injector suction hose (WP 0066).

END OF WORK PACKAGE

CHAPTER 3

FIELD MAINTENANCE INSTRUCTIONS FOR DECONTAMINATING APPARATUS: JOINT SERVICE TRANSPORTABLE SMALL SCALE, M26

FIELD MAINTENANCE
SERVICE UPON RECEIPT

INITIAL SETUP:

Test Equipment
Not Applicable

Personnel Required
Equipment Repairer/Mechanic (4)

Tools
Tool Kit, General Mechanic (WP 0082, Item 2)

References
AR 735-11-2
DA PAM 750-8
TM 3-4230-238-10

Materials/Parts
SF 364, Report of Discrepancy

Equipment Condition
Not applicable

GENERAL INFORMATION

The following paragraphs contain the procedures for unpacking and general checking of the unpacked applicator module and accessory kit.

Inspect equipment for damage incurred during shipment. If equipment has been damaged, report damage on SF 364, Report of Discrepancy (ROD) in accordance with AR 735-11-2.

Check equipment against the packing slip to see if shipment is complete. Report all discrepancies in accordance with applicable service instructions (e.g., for Army instructions see DA PAM 750-8). Check to see whether equipment has been modified.

1. Reject if Items are missing, deformed, show obvious physical damage, rust or corrosion.
2. Check that special tools, components of end items, and basic issue items are with the equipment. Technical manuals must also be present.
3. Inspect to make sure stencil markings are present and readable.

UNPACKING EQUIPMENT

WARNING

HEAVY PARTS

EYE PROTECTION

Wear eye protection, protective clothing, and protective gloves when applying or removing banding from equipment. Releasing tension from banding may cause banding to fly off and injure personnel.

Pinching hazard exists when moving heavy pieces of equipment. Keep hands clear of heavy parts to avoid risk of personal injury.

1. Remove banding from reusable box, IAW local OP.

UNPACKING EQUIPMENT-CONTINUED

2. Undo fasteners (Figure 1, Item 3) that secure reusable box (Figure 1, Item 2) to pallet base (Figure 1, Item 1).

WARNING

HEAVY OBJECTS

The M26 applicator module weighs over 550 pounds (249 kg). To avoid injury to personnel, use material handling equipment (MHE) to move or load the unit.

The accessory box, due to size and weight, requires a four-person lift for removal and installation. Always avoid back injury by lifting with your legs.

3. Lift reusable box off of pallet base and place on ground, using at least two personnel.

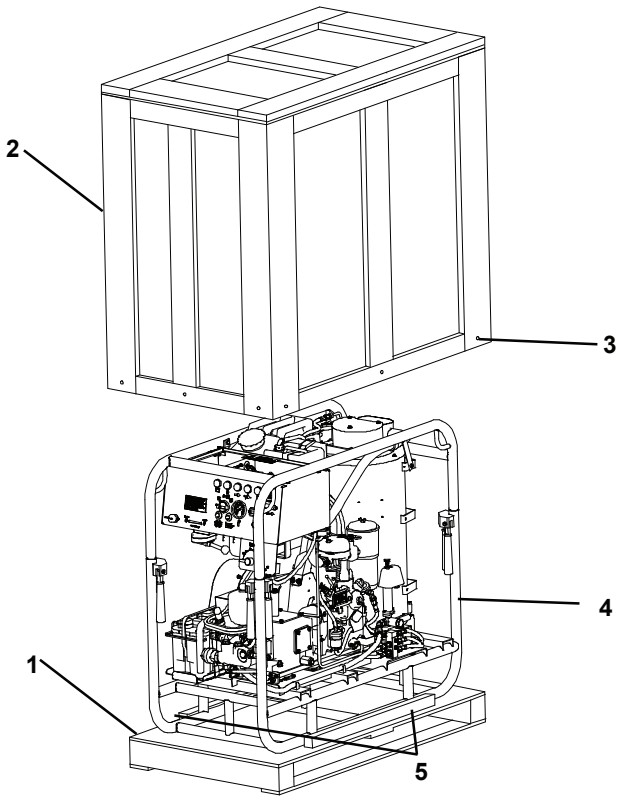


Figure 1. M26 Applicator Module.

4. Remove blocking material (Figure 1, Item 5) that secures applicator module (Figure 1, Item 4) to pallet base (Figure 1, Item 1).
5. Lift applicator module (Figure 1, Item 4) from pallet base (Figure 1, Item 1) and set on flat level ground, using MHE.
6. Retain reusable box and pallet base for long-term storage or shipment of applicator module.
7. Remove banding from accessory kit (Figure 2, Item 1), IAW local OP. Remove accessory kit from pallet (Figure 2, Item 2).

CHECK UNPACKED EQUIPMENT

1. Inspect applicator module:
    a. Check frame and handles for cracks, damage, and loose mounting. If handles are missing or damaged, replace (WP 0065).
    b. Check bolts, clamps, nuts and screws for looseness. Inspect frame for chipped paint, bare metal, rust, or corrosion around bolt/screw heads and nuts.
    c. Inspect welds for chipped paint, rust, corrosion, and gaps.
    d. Inspect electrical wires, connectors and harnesses for cracked or broken insulation, bare wires, and broken connectors. Tighten loose connectors.
    e. Inspect hoses and fluid lines for wear, damage and leaks. Verify all clamps and fittings are tight.
2. Inspect exterior of accessory kit. Check for dents, broken or bent latches, missing or damaged handles.
3. Remove any locks or wraps around latches. Open accessory kit (Figure 2, Item 1) and check for damage to lid.
4. Remove packaging from new accessory kit as follows:
    a. If kit items are packaged from the factory, remove all temporary shipping packaging from kit items.
    b. Accessory kit ships from factory with an initial spares kit. Inventory spares kit (if present in accessory kit) IAW provided component list.
    c. If items are not factory packaged, proceed to next step.
5. Inventory the accessory kit (Operator's Manual WP 0031), checking items for damage.

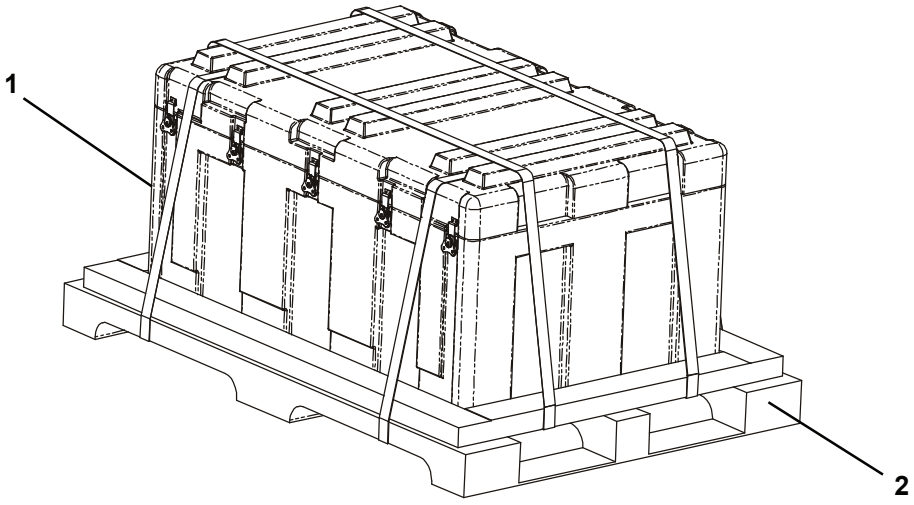


Figure 2. Accessory Kit.

END OF TASK

PREPARE SYSTEM FOR INITIAL USE

Perform the following task to prepare applicator module for initial operator use, tactical shipment, or short-term storage. Task as written applies to both factory new systems and a lateral transfer.

NOTE

Army PMCS is the equivalent to Navy Planned Maintenance System (PMS).

1. Perform BEFORE PMCS for accessory kit and shower bar (Operator's Manual, WP 0020).

NOTE

Accessory kit from factory contains two calcium inhibitor containers. One should be installed for initial use with system. Other container should be removed from accessory kit and retained for use with system, IAW local operating procedures. Other than initial shipment from factory, do not store calcium inhibitor container (open or unopened) in accessory kit.

2. Unpack calcium inhibitor container from accessory kit, or obtain calcium inhibitor container from unit supply.
3. Prepare battery for use:
   a. Remove shipment caps (or electrical tape) from battery terminals. Retain caps for re-use.
   b. Attach positive terminal protective cover and terminal lug. Tighten terminal lug (Figure 3, Item 1).
   c. Attach negative terminal protective cover and terminal lug. Tighten terminal lug (Figure 3, Item 3).
   d. Close terminal protective covers (Figure 3, Item 2).

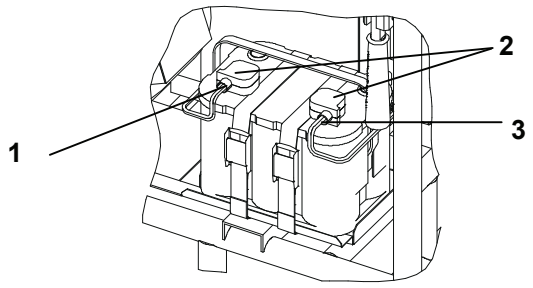


Figure 3. Battery

4. Perform Operator BEFORE PMCS for applicator module (Operator's Manual, WP 0020).
5. Perform preparation for use (Operator's Manual, WP 0005).
6. Perform high-pressure operation setup (Operator's Manual, WP 0006).
7. Perform starting procedures (Operator's Manual, WP 0007).
8. Perform cold water operations (Operator's Manual, WP 0008).
9. Perform equipment shutdown (Operator's Manual, WP 0013).
10. Perform preparation for short-term storage (Operator's Manual, WP 0014).
11. System is ready for short-term storage or tactical movement.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) INTRODUCTION

GENERAL

NOTE

Army PMCS is the equivalent to Navy Planned Maintenance System (PMS).

Periodic Preventive Maintenance Checks and Services (PMCS) are performed to maintain the M26 in operating condition. Field maintenance personnel are to do the scheduled maintenance tasks as shown in the Scheduled Maintenance table. Pay attention to Warning, Caution, and Note statements in any WP referenced as part of the PMCS table. Warnings contain information that if ignored could result in death or injury to personnel. Cautions contain information that if ignored could result in damage to equipment. Notes contain instructional information.

ITEM NUMBER COLUMN

Checks and services are numbered in chronological order regardless of interval. Use this column as the source of Item numbers when recording PMCS results in the “TM Number” column on DA Form 2404/ DA Form 5988E, Equipment Inspection and Maintenance Worksheet. For further information on how to use these forms, see DA PAM 750-8.

INTERVAL COLUMN

This column indicates when to do certain checks or services. Sometimes more than one check or service interval may be placed in an interval column. This indicates the maintainer shall do those checks or services at each of those intervals.

Quarterly (100 hrs) - Q
Semi-Annual (300 Hrs) - S
Annual (500 Hrs) - A

ITEM TO BE CHECKED OR SERVICED COLUMN

The Items listed in this column are identified by their common names.

PROCEDURE COLUMN

This column briefly identifies the procedure to be checked. It contains all information required to accomplish the checks and services, including appropriate tolerances, adjustments and gauge readings.

PRIOR TO STORAGE OR SHIPMENT

A complete PMCS will be performed prior to storage or shipment IAW WP 0067. Additionally, PMCS will be performed on the applicator module as part of service upon receipt (WP 0006).

FLUID LEAKAGE

It is necessary for you to know how ~uid leakage a°ects the status of the M26. Following are types/classes o~ eakage you need to know to be able to determine the status of the M26. Learn these leakage deÿnitions and remember - when in doubt, notify your supervisor. Equipment operation is allowed with minor leakage (Class I or II). Consideration must be given to ~uid capacity in the item/system being checked/inspected.

When operating with Class I or II leaks, continue to check ~uid levels as required in the PMCS.

Class III leaks should be reported immediately to your supervisor.

- CLASS I Seepage o~ uid (as indicated by wetness or discoloration) not great enough to form drops.
- CLASS II Leakage o~ uid great enough to form drops, but not enough to cause drops to drip from Item being checked/inspected.
- CLASS III Leakage o~ uid great enough to form drops that fall from the Item being checked/inspected.

INSPECTION

Look for signs of a problem or trouble with the M26. Senses help here. You can feel, smell, hear or see many problems. Be alert when using the equipment.

Inspect to see if components of the end item are in good condition. Are they correctly assembled, stowed, secured, and properly lubricated? Do you observe any items that are excessively worn, leaking, or corroded? Correct any problems found following PMCS, Troubleshooting, and maintenance tasks.

There are some common items to check all over the equipment. These include the following:

1. Bolts, clamps, nuts and screws: Continuously check for looseness. Look for chipped paint, bare metal, rust, and corrosion around bolt and screw heads and nuts. Tighten them when you ÿnd them loose.

2. Welds: Many Items on the equipment are welded. To check these welds, look for chipped paint, rust, corrosion, and gaps. When these conditions exist, repair as necessary.

3. Electrical wires, connectors and harnesses: Tighten loose connectors. Look for cracked or broken insulation, bare wires, and broken connectors. If any are found repair or replace them if necessary.

4. Hoses and ~uid lines: Look for wear, damage and leaks. Make sure clamps and ÿttings are tight. Wet spots or a stain by a ÿtting or connector may indicate a leak. Refer to Fluid Leakage section of this WP for leak classiÿcation deÿnitions. When you ÿnd a leak, repair or replace clamps and ÿttings as required.

UNDER UNUSUAL CONDITIONS

Servicing the module is required more often when operating in extreme conditions. Servicing more often is also required after operating in dust, mud or sand. Local OP will authorize changes of the PMCS intervals when the module is operated under unusual conditions.

REPAIRS

After all maintenance repairs or services, operate the module to ensure that the equipment functions properly.

CLEANING AND LUBRICATION

Proper cleaning and lubrication can aid in avoiding possible problems or trouble, so make it a habit to do the following:

CAUTION

Follow all cleaning and lubrication instructions carefully; failure to do so can result in damage to equipment.

1. Thoroughly wash all equipment exposed to dirt, dust or sand with clean, fresh water.
2. Clean grease fittings before and after lubrication.
3. Lubricate all equipment at conclusion of operation before equipment storage.
4. Always use PMCS lubrication instructions as a guide.
5. Never use too much lubricant.
6. Never use the wrong type or grade of lubricant.
7. Lubricate more during constant use and less during inactive periods.
8. Use the correct grade of lubricant for seasonal temperature expected.

CORROSION PREVENTION AND CONTROL (CPC)

Corrosion Prevention and Control (CPC) of U.S. Government materiel is a continuing concern. It is important that any corrosion problems with this Item be reported so that the problem can be corrected and improvements can be made to prevent the problem in future Items.

Corrosion is typically associated with rusting of metals or galvanic corrosion, which produces a white powder. The category of corrosion also includes deterioration of other materials, such as rubber and plastic. Unusual cracking, softening, swelling, or breaking of the materials may be a corrosion problem. If a corrosion problem is identified, it can be reported using SF 368, Product Quality Deficiency Report. Use of key words, such as “corrosion”, “rust”, “deterioration”, or “cracking”, will ensure that the information is identified as a CPC problem. The form should be submitted to the address specified in DA PAM 750-8.

WARRANTY INFORMATION

For equipment under manufacturer's warranty, hard-time oil service intervals shall be followed. Intervals shall be shortened if lubricants are known to be contaminated or if operation is under adverse conditions (such as longer-than-usual operating hours, extended idling periods or extreme dust).

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) AND LUBRICATION SERVICES

INITIAL SETUP:

Test Equipment
Not Applicable

Tools
Tool Kit, General Mechanic (WP 0082, Item 2)

Personnel Required
Equipment Repairer/Mechanic
Operator

References

WP 0009	WP 0025	WP 0043	WP 0054
WP 0010	WP 0026	WP 0044	WP 0056
WP 0011	WP 0027	WP 0045	WP 0057
WP 0012	WP 0030	WP 0046	WP 0058
WP 0013	WP 0031	WP 0047	WP 0064
WP 0016	WP 0032	WP 0049	WP 0066
WP 0017	WP 0035	WP 0050	
WP 0019	WP 0036	WP 0051	TM 10-
WP 0020	WP 0038	WP 0052	5430-237-
WP 0022	WP 0039	WP 0053	12&P
WP 0024	WP 0042	WP 0053.1	

Materials/Parts
Cloth, Cleaning (WP 0083, Item 3)
Pan, Drain (WP 0083, Item 8)

Equipment Condition
Equipment set on level ground

NOTE

PMCS table is divided into sections for each major system component. Be sure to read all WP pages to find PMCS for the Applicator Module, Accessory Kit, Shower Bar and 30 00 Gallon Water Tank (AAL). Performing the scheduled maintenance and lubrications will reduce the chances of equipment breakdown. WP 0002 contains details that will help in locating major components.

Table 1. Field Maintenance Preventive Maintenance Checks and Services.

SEQ. NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURES	EQUIPMENT NOT READY/ AVAILABLE IF:
1	Q/S/A	**M26, COMPLETE UNIT**	1. Visually inspect exterior for damage and missing parts.	Bends or cracks are found on frame assembly.
			2. Check components for cleanliness, firm seating and for leakage.	Class III leakage or any fuel leakage is found.
		APPLICATOR MODULE		
2	Q/S/A	Water Pump	1. Check mounting bolts. Tighten if loose.	Pump mounting bolts missing.
			2. Check for leakage.	Class III oil or water leakage is found.

Table 1. Field Maintenance Preventive Maintenance Checks and Services - Continued

SEQ. NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURES	EQUIPMENT NOT READY/ AVAILABLE IF:
		Water Pump (Continued)	3. Check oil level, add if necessary. a. If oil level sight glass is leaking, replace sight glass (WP 0017). b. If water pump filler/vent mounting gasket is leaking, replace mounting gasket (WP 0020).	
			4. Check pump valves for bends and cracks (WP 0019).	Pump valves are damaged.
			5. Check input and output high pressure hoses for leakage or damage. Replace, if necessary (WP 0013).	Class III leakage is found or hoses are damaged.
3	Q/S/A	V-belts of Water Pump and Blower	Check tension of V-belts, adjust if necessary, (WP 0011). If damaged or missing replace V-belts (WP 0011).	V-belts are broken or damaged.
4	Q/S/A	Water pressure gauge	1. Check for obvious damage. If pressure gauge is damaged, replace pressure gauge (WP 0012).	Damaged or missing.
			2. Check calibration expiration date on gauge label. If expired, replace with calibrated gauge (WP 0012).	Calibration date has expired or label missing.
5	Q	Diesel Engine	1. Check for cleanness and clean if necessary.	Class III leakage is found.
			2. Inspect air filter assembly (WP 0053), clean if necessary. If damaged, replace (WP 0053.1).	
			3. Change oil (15W40) and fill to markings on dipstick (WP 0051). If dipstick is damaged, replace dipstick (WP 0052).	
			4. Inspect valve cover, replace if damaged (WP 0056). Check valve clearance, adjust if necessary (WP 0057).	Class III leakage is found.
			5. Check engine exhaust pipe for leaks or damage. If leaking or damaged replace exhaust pipe (WP 0064).	Exhaust pipe is damaged or leaks at engine connection.

Table 1. Field Maintenance Preventive Maintenance Checks and Services - Continued

SEQ. NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURES	EQUIPMENT NOT READY/ AVAILABLE IF:
		Diesel Engine (Continued)	6. Clean cooling fins (WP 0058).	
6	Q/S/A	Fuel Lines	Check for damage or leaks.	Any fuel leakage is found.
7	Q	Fuel Can	Check for damage or leakage.	Any fuel leakage is found or fuel can is damaged.
8	Q/S/A	Battery	1. Check battery terminals, clamps, posts, or cables for corrosion or loose connection. Service battery if corrosion or poor connection is found (WP 0025).	Loss of electrical contact. Battery damaged.
			2. Test charging system (WP 0036). If charging rate is below 13.2 volts, replace regulator (WP 0036).	Charging rate is below 12.5 volts.
9	Q/S/A	Electrical Control Box	1. Visually check for outside physical damage. If exterior damage is so severe the applicator module will not operate normally, replace control box (WP 0026).	Damage to control box is severe and is non-operational.
			2. Check condition of equipment controls and indicators. Replace if missing or damaged as follows: a. Replace indicator lights, (WP 0027). b. Replace selector switch, (WP 0030). c. Replace oil or air pre-heater switches, (WP 0032). d. Check and/or replace thermostat, (WP 0035). e. Replace hour meter, (WP 0031). f. Replace fuel sensor, (WP 0042).	Any missing, inoperative or damaged equipment controls, switches and indicator lights that would allow equipment damage.
10	Q/S/A	Electrical Harness	Inspect for damaged, loose or broken cables. Replace damaged cable (WP 0025 or WP 0026), as appropriate.	Any damage is evident.

Table 1. Field Maintenance Preventive Maintenance Checks and Services - Continued

SEQ. NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURES	EQUIPMENT NOT READY/ AVAILABLE IF:
11	Q/S/A	High-pressure fittings and High pressure burner outlet	Inspect for cracks, damaged threads or missing components. Replace damaged burner outlet (WP 0038).	Any damage is evident.
12	Q/S/A	Water pressure on the water pressure gauge	1. Operate applicator module in cold water operation with the high-pressure nozzle. Pressure should be at approximately 870 PSI / 60 BAR. If pressure gauge does not indicate pressure during pumping operation, replace pressure gauge (WP 0012). 2. Decalcify flow heater (WP 0044).	Water pressure gauge inoperative, damaged or leaking water.
13	Q/S/A	Attachment bolts for Water Pump, Engine and Flow Heater Mounting	Check for loose or missing mounting bolts. Tighten, if necessary (WP 0010, WP 0050 and WP 0049).	Bolts loose or missing.
14	Q/S/A	Burner Photo Cell and Sight Glass	Clean burner photo cell and sight glass (WP 0047).	
15	S/A	Diesel Engine	1. Change engine oil and oil filter. Fill 33.08 oz.(1/L) 15W 40 oil to markings on dipstick (WP 0051). 2. Replace fuel filter, (WP 0054). 3. Replace air filter element, (WP 0053).	
16	S/A	Suction Line, Calcium Inhibitor	Check hoses and injector screen. Replace if damaged, (WP 0039). Check filter, replace if necessary (WP 0037).	
17	A	Water Pump	1. Change water pump oil, 67.6 oz.(2 L), (WP 0009).	

Table 1. Field Maintenance Preventive Maintenance Checks and Services - Continued

SEQ. NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURES	EQUIPMENT NOT READY/ AVAILABLE IF:
		Water Pump- Continued	2. Check pressure in pulsation damper. Replace, if necessary (WP 0016).	
18	S/A	Flow Heater	1. Clean and inspect heating coils (WP 0043), burner refractory bottom and boiler parts. If heating coils or burner refractory bottom is cracked or broken, replace flow heater (WP 0049).	Heating coils are damaged or burner refractory bottom is cracked or broken.
			2. Clean burner nozzle (WP 0046).	
			3. Clean and adjust gap of igniter electrodes (WP 0045).	
19	Q/S/A	Blower	1. Check damper and damper spring operation, replace if broken or damaged (WP 0024).	
			2. Check cloth collar for damage. Replace if torn or damaged (WP 0022).	Cloth collar missing or damaged.
		ACCESSORY KIT		
		ACCESSORY KIT, ACCESSORY CASE AND PARTS	Visually inspect kit and case for damage and missing parts.	
20	Q/S/A	High-pressure Hoses /Pipes	1. Check hoses/pipes for leaks, cracks, bends or looseness.	Any damage is evident or Class III leakage is found.
			2. Check for leakage.	
			3. Check for firm seating.	
21	Q/S/A	Hose, hose couplings and Suction Filter Basket	Visually inspect for cracks, missing seals or other damage.	Any damage or missing seals.
22	Q/S/A	Hand spray gun	Check that trigger is not broken, bent or missing.	Any damage or missing parts.
23	Q/S/A	Spray Lance with seals	Check condition of o-rings.	Any damaged or missing o-rings.

Table 1. Field Maintenance Preventive Maintenance Checks and Services - Continued.

SEQ. NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURES	EQUIPMENT NOT READY/ AVAILABLE IF:
		SHOWER ASSEMBLY		
24	S/A	**SHOWER ASSEMBLY**	1. Check exterior condition.	Class III leakage is found.
			2. Check components for cleanness, firm seating and for leakage.	
		Hoses	1. Check for cracks or holes.	Any leakage is found.
			2. Check for leakage.	
25	S/A	Safety Valve	1. Perform functional test (WP 0066).	Safety valve fails functional test.
			2. Check for leaks and proper operation.	Leak is found or safety valve is inoperative.
26	S/A	Injector Kit	1. Check for leaks.	Any leakage is found.
			2. Check for proper operation.	Does not operate properly.

Table 2. Field Maintenance Preventive Maintenance Checks and Services for AAL.

SEQ. NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURES	EQUIPMENT NOT READY/ AVAILABLE IF:
		3000 GALLON WATER TANK (OPTIONAL)		
1	S/A	**3000 GALLON WATER TANK**	Check for leaks. Temporarily repair all leaks with patches in water tank repair kit (See TM 10-5430-237-12&P for maintenance procedures).	Water tank leaks.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
CHANGING WATER PUMP OIL

INITIAL SETUP:

Test Equipment
Not Applicable

Tools
Tool Kit, General Mechanic (WP 0082, Item 2)
Funnel (WP 0082, Item 3)

Materials/Parts
Pan, Drain (WP 0083, Item 8)
Oil, Water Pump (WP 0083, Item 7)
Cloth, Cleaning (WP 0083, Item 3)

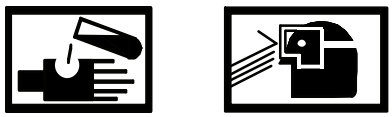
Personnel Required
Equipment Repairer/Mechanic

References
Not Applicable

Equipment Condition
Applicator module set on level ground
Engine off and cool

CHANGING WATER PUMP OIL

WARNING



CHEMICAL **EYE PROTECTION**

Excessive exposure to pump oil may result in eye, skin or respiratory irritation. Wear eye protection, protective clothing and protective gloves when handling and using this product. Use only with adequate ventilation.

1. Remove oil drain plug and washer (Figure 1, Item 1) and drain oil into drain pan.

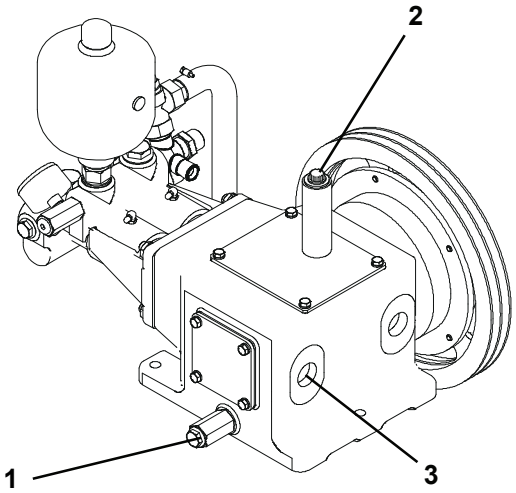


Figure 1. Water Pump Assembly.

CHANGING THE WATER PUMP OIL - CONTINUED

2. Clean oil drain plug and reinstall.
3. Remove oil filler plug (Figure 1, Item 2) from water pump.
4. Fill water pump housing with pump oil through filler opening (Figure 1, Item 2) until middle of oil level indicator (Figure 1, Item 3) is reached (approximately 2.11qts / 2L).
5. Reinstall oil filler plug with washer (Figure 1, Item 2) and tighten.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
WATER PUMP AND WATER PUMP CLUTCH ASSEMBLY REPLACEMENT

INITIAL SETUP:

Test Equipment
Not Applicable

Personnel Required
Equipment Repairer/Mechanic (2)

Tools
Tool Kit, General Mechanic (WP 0082, Item 2)
Funnel (WP 0082, Item 3)
Bit, star-head (WP 0082, Item 3)

References
WP 0009

Materials/Parts
Pump, Reciprocating (WP 0069, Item 1)
Clutch, Magnetic (WP 0069, Item 25)
Solvent, Cleaning (WP 0083, Item 10)
Cloth, Cleaning (WP 0083, Item 3)
Oil, Water Pump (WP 0083, Item 7)
Strap, Tiedown electrical (WP 0083, Item 11)
Pan, Drain (WP 0083, Item 8)

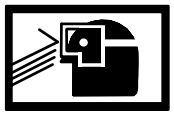
Equipment Condition
Applicator module set on level ground
Engine off
Ensure system pressure is relieved
Calcium Inhibitor container removed

WATER PUMP REMOVAL

WARNING

HIGH PRESSURE

CHEMICAL


EYE PROTECTION

Contents under high pressure in equipment can cause serious bodily injury when the pressure is not properly released before handling the equipment.

Excessive exposure to pump oil may result in eye, skin or respiratory irritation. Wear eye protection, protective clothing and protective gloves when handling and using this product. Use only with adequate ventilation.

Wear eye protection and protective clothing when handling equipment under high pressure.

NOTE

The water pump assembly is a direct replacement including valves, clutch, pulley and adapters. The water pump assembly weighs in excess of 70 pounds (32kg) and requires a two-person lift.

1. Disconnect applicator module battery.
   a. Unclip negative terminal protective cover.
   b. Remove negative terminal connector from battery.

WATER PUMP REMOVAL - CONTINUED

2. Place drain pan under drain plug (Figure 1, Item 1).
3. Remove water pump oil drain plug (Figure 1, Item 1) and washer and drain oil into drain pan. Reinstall drain plug.
4. Remove screw (Figure 1, Item 3) retaining throttle cable bracket (Figure 1, Item 4) at water pump vent housing (Figure 1, Item 2).

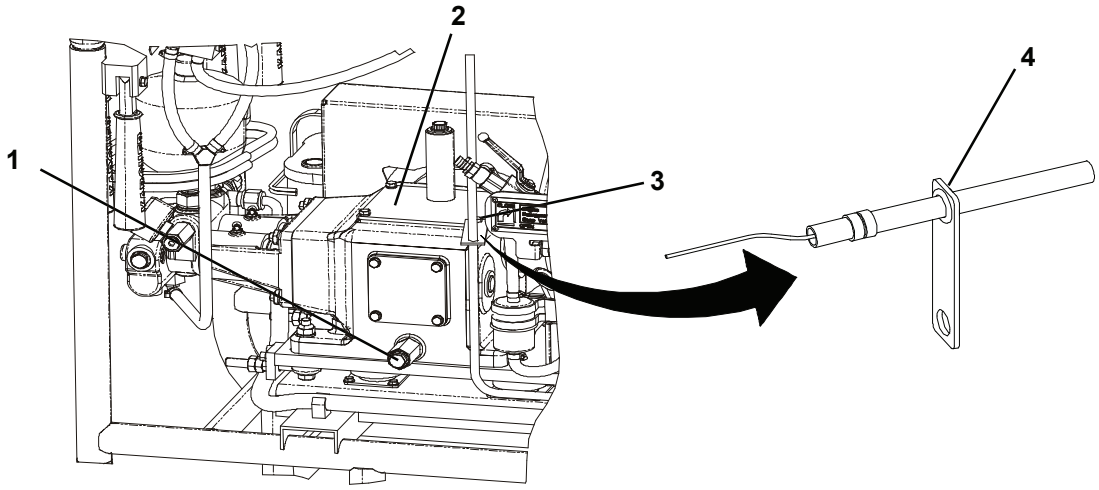


Figure 1. Water Pump Assembly and Throttle Cable Bracket Assembly.

5. Remove throttle cable bracket (Figure 1 Item 4) and reinsert screw (Figure 1, Item 3) into water pump vent housing (Figure 1, Item 2) and tighten.
6. Disconnect high-pressure outlet hose (Figure 2, Item 1) from pump outlet adapter.

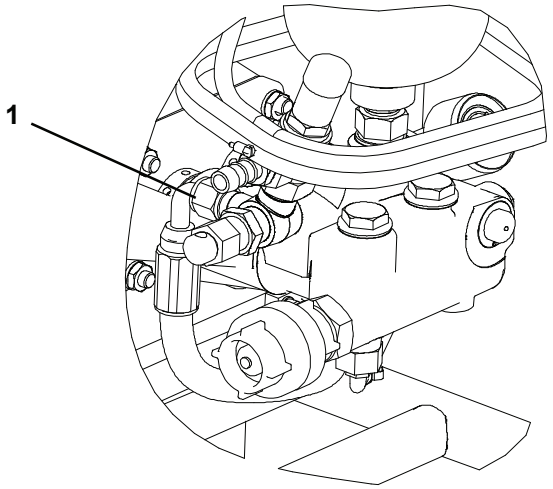


Figure 2. Water Pump High-Pressure Outlet Hose.

WATER PUMP REMOVAL - CONTINUED

7. Loosen hose clamp (Figure 3, Item 3) and disconnect clear tubing (Figure 3, Item 4) at water pump check valve (Figure 3, Item 2).

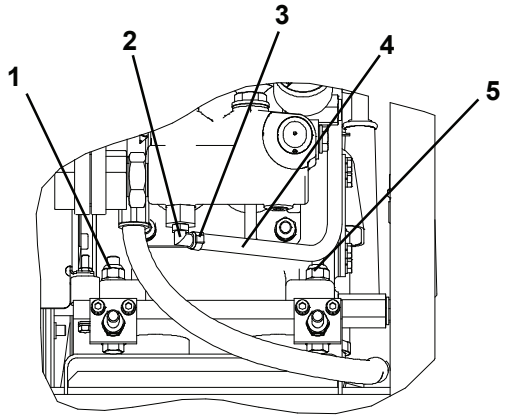


Figure 3. Water Pump Mounting Bolts - Front.

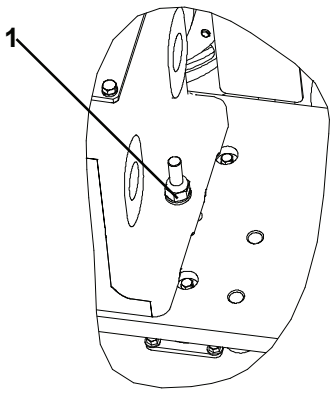


Figure 4. Water Pump Mounting Bolt - Back.

8. Remove screw and two washers securing V-belt protective cover (Figure 5, Item 1).
9. Remove bolt, nut, and bushing from front of V-belt protective cover (Figure 5, Item 1).
10. Remove hex nut and lock washer on side of V-belt protective cover (Figure 5, Item 1). Remove cover.

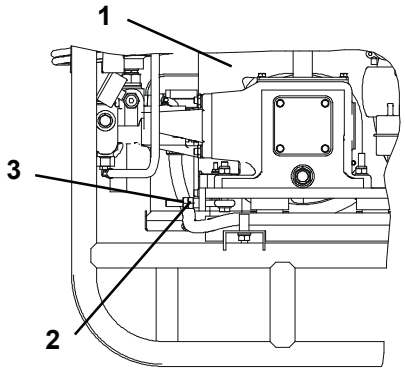


Figure 5. Water Pump Adjustment Bolts

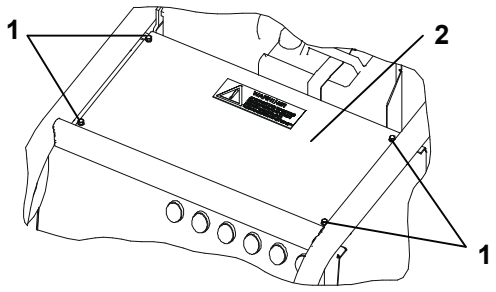


Figure 6. Control Box Assembly - Top.

11. Loosen three hex-nuts (Figure 3, Items 1 and 5 and Figure 4 Item 1).
12. Loosen two locking nuts (Figure 5, Item 3).
13. Loosen two adjustment nuts (Figure 5 Item 2).
14. Move water pump toward engine to loosen V-belts and remove V-belts from water pump pulley
15. Remove three water pump mounting bolts (Figure 3, Items 1 and 5 and Figure 4, Item 1).
16. Loosen four bolts (Figure 6, Item 1) retaining control box cover (Figure 6, Item 2).

WATER PUMP REMOVAL - CONTINUED

17. Loosen and remove five screws and washers (Figure 7, Item 1) securing control box rear panel (Figure 7, Item 2).
18. Remove panel toward engine side.

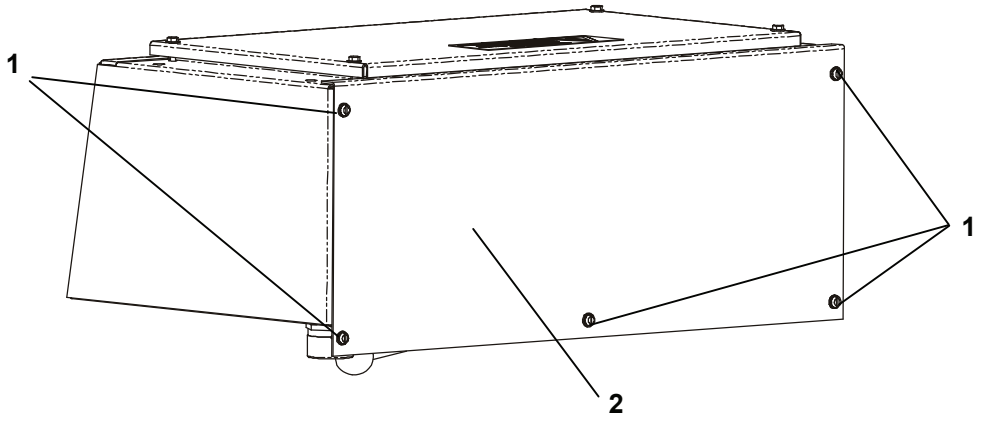


Figure 7. Control Box Assembly - Rear.

19. Locate and remove water pump wire retaining nut from wire isolator (Figure 8, Item 1) on bottom of control box
20. Trace wiring from water pump clutch to X1 terminal and remove wires as follows:
    a. Remove cable ties.
    b. Disconnect brown wire from position 29 and blue wire from position 33 on X1 terminal by loosening recessed screw (Figure 8, Item 2) retaining wires.

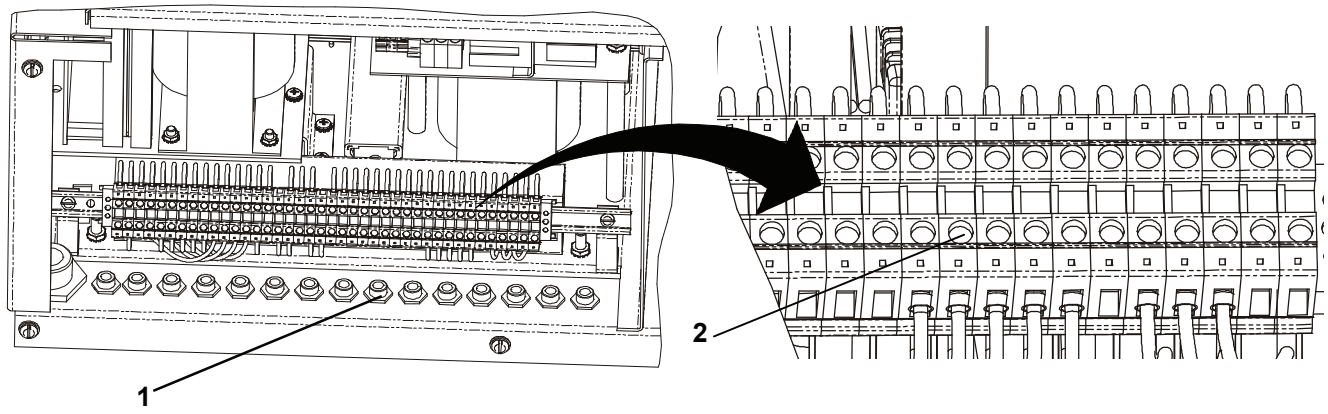


Figure 8. X1 Terminal.

21. Remove water pump assembly from base mounting plate.

END OF TASK

WATER PUMP INSTALLATION

NOTE

The water pump assembly weighs in excess of 70 lbs (31.75 kg) and requires a two person lift.

1. Place water pump assembly onto base mounting plate.
2. Install three water pump mounting bolts (Figure 9, Items 1 and 2 and Figure 10, Item 1) and nuts. Do not tighten.

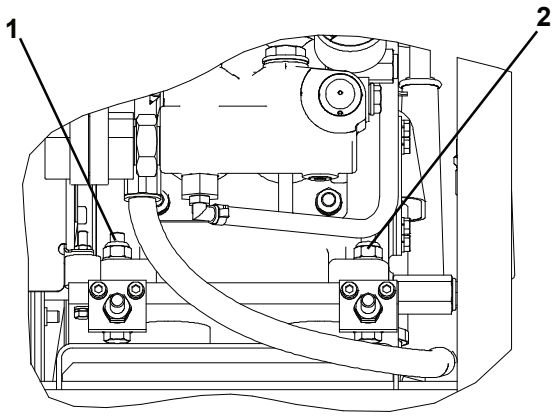


Figure 9. Water Pump Mounting Bolts-Front.

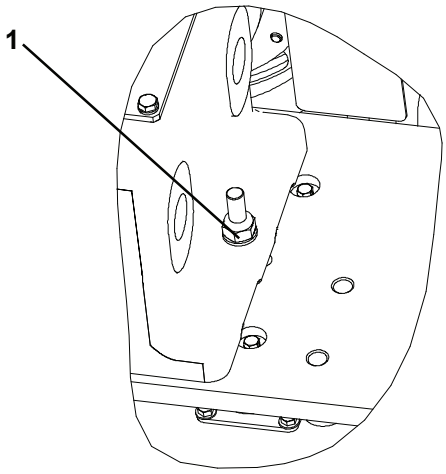


Figure 10. Water Pump Mounting Bolt – Back.

3. Install water pump V-belts onto water pump pulley.
4. Adjust water pump V-belt tension by turning adjustment nuts (Figure 5, Item 2) evenly until there is a 1/4 inch deflection in belts. Deflection should be no more than 1/4 inch at midpoint between pulleys.
5. Secure water pump adjustment nuts (Figure 5, Item 2) using locking nuts (Figure 5, Item 3) tightened against adjustment nuts (Figure 5, Item 2).
6. Tighten three hex-nuts (Figure 9, Items 1 and 2 and Figure 10 item 1).
7. Install V-belt protective cover (Figure 5, Item 1) and secure and tighten with one screw and two washers.
8. Install bushing, screw, and nut. Tighten screw, and nut.
9. Install hex nut and lock washer on side of V-belt protective cover and tighten.

WATER PUMP INSTALLATION - CONTINUED

10. Install high pressure outlet hose (Figure 11, Item 1).

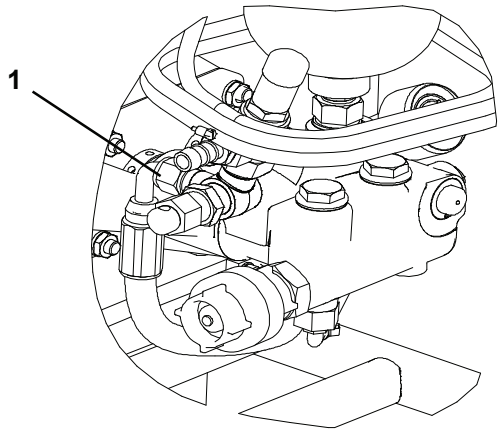


Figure 11. Water Pump High-Pressure Outlet Hose.

11. Install clear tubing (Figure 12, Item 3) and hose clamp (Figure 12, Item 2) onto water pump check valve (Figure 12, Item 1).

12. Tighten hose clamp (Figure 12, Item 2).

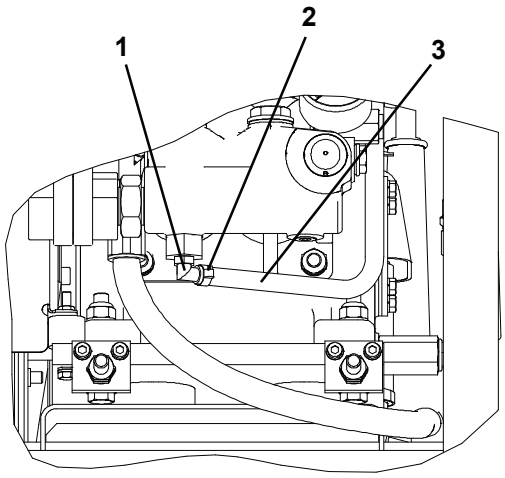


Figure 12. Water Pump High-Pressure Outlet Hose.

WATER PUMP INSTALLATION - CONTINUED

13. Feed water pump clutch wiring through wire isolator (Figure 13, Item 1) on bottom of control box and tighten retaining nut.
14. Connect brown wire to position 29 and blue wire to position 33 on X1 terminal and tighten recessed screw (Figure 13, Item 2) to retain wires.
15. Install rear control box panel (Figure 7, Item 2) and secure with five screws and washers (Figure 7, Item 1).
16. Install control box top panel (Figure 6, Item 2) and secure with four bolts (Figure 6, Item 1).

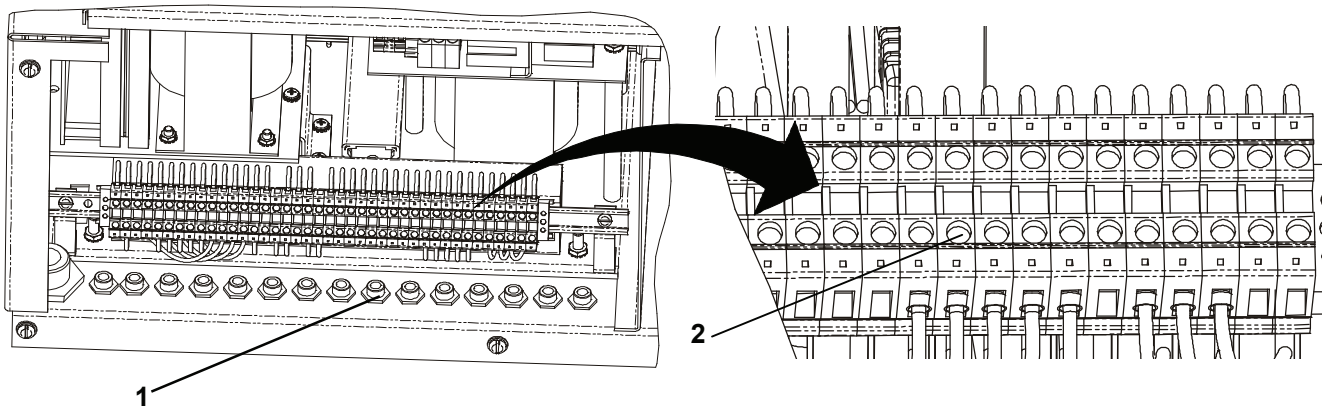


Figure 13. X1 Terminal.

17. Remove one water pump vent housing screw (Figure 14, Item 3) that is closest to the engine and outside edge of pump.

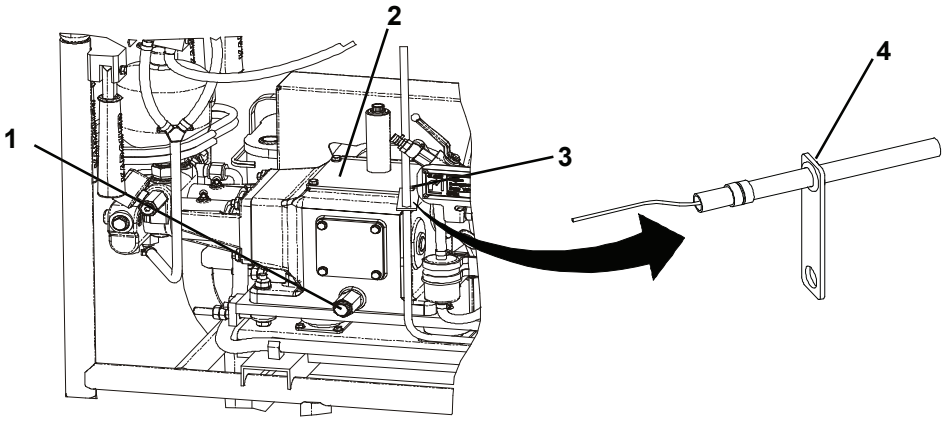


Figure 14. Water Pump Assembly and Throttle Cable Bracket Assembly.

18. Install throttle cable bracket and throttle cable (Figure 14, Item 4) onto water pump vent housing (Figure 14, Item 2). Secure with vent housing screw (Figure 14, Item 3).
19. Reinstall cable ties.
20. Add oil to water pump (WP 0009).
21. Reinstall calcium inhibitor container.

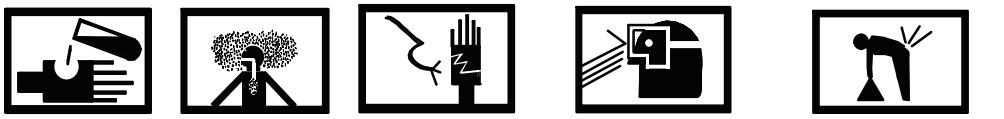
WATER PUMP INSTALLATION - CONTINUED

22. Connect applicator module battery.
    a. Connect negative battery terminal to battery.
    b. Close and clip terminal protective cover.

END OF TASK

WATER PUMP CLUTCH ASSEMBLY REMOVAL

WARNING



Excessive exposure to solvent may result in eye, skin or respiratory irritation. Wear eye protection, protective clothing and protective gloves when handling and using this product. Use only with adequate ventilation.

Always disconnect battery cables before performing maintenance to prevent electrical shock which could cause injury or death. Always wear eye protection and protective gloves when handling the battery.

The clutch weighs in excess of 15 lbs (6.8 kg). Always use caution when lifting heavy equipment to avoid back injury.

1. Disconnect and remove battery.
    a. Unclip terminal covers (Figure 15, Item 2).
    b. Remove negative terminal connector (Figure 15, Item 3) and protective cover from battery.
    c. Remove positive terminal connector (Figure 15, Item 5).and protective cover from battery.
    d. Loosen battery hold down straps (Figure 15, Item 4) and lift battery from tray using attached handle (Figure 15, Item 1).

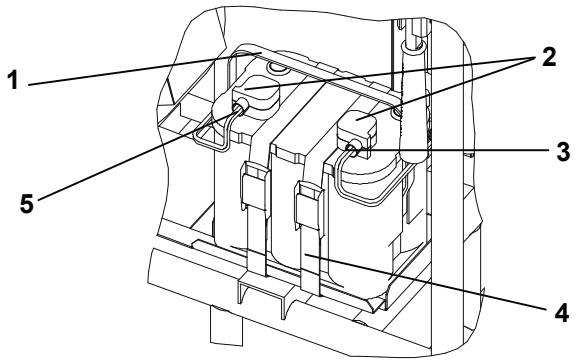


Figure 15. Battery.

WATER PUMP CLUTCH ASSEMBLY REMOVAL - CONTINUED

2. Drain oil from pump (WP 0009).
3. Loosen four control box top panel screws (Figure 6, Item 1) and remove top control panel cover (Figure 6, Item 2).
4. Remove the five retaining screws (Figure 7, Item 1) from control box rear panel and remove rear panel (Figure 7, Item 2).
5. Locate and remove water pump wire retaining nut from wire isolator (Figure 16, Item 1) on bottom of control box
6. Trace wiring from water pump clutch to X1 terminal and remove wires as follows:
   a. Remove cable ties.
   b. Disconnect brown wire from position 29 and blue wire from position 33 on X1 terminal by loosening recessed screw (Figure 16, Item 2) retaining wires.

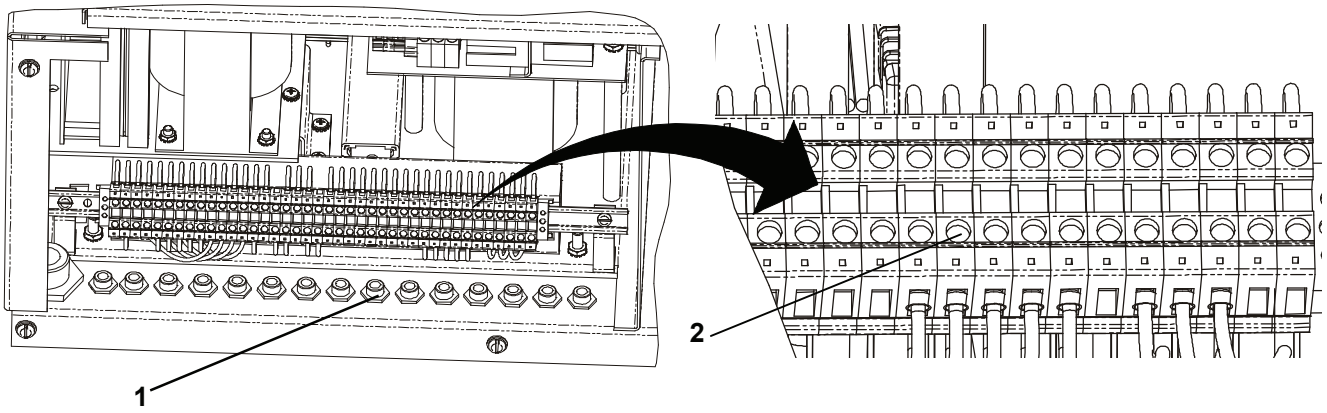


Figure 16. X1 Terminal - Inside of Control Box.

WATER PUMP CLUTCH ASSEMBLY REMOVAL - CONTINUED

8. Remove screw and two washers securing V-belt protective cover (Figure 17, Item 4).
9. Remove bolt, nut, and bushing from front of V-belt protective cover (Figure 17, Item 4).
10. Remove hex nut and lock washer on side of V-belt protective cover (Figure 17, Item 4) and remove cover.
11. Loosen three hex-nuts (Figure 17, Item 3).
12. Loosen two locking nuts (Figure 17, Item 1).
13. Loosen two adjustment nuts (Figure 17, Item 2).

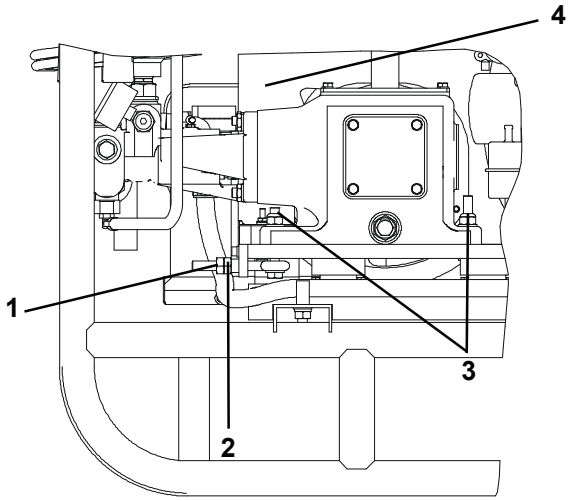


Figure 17. V-Belt Assembly.

14. Move water pump toward engine to loosen V-belts.
15. Remove V-belts from water pump pulley.
16. Loosen and remove five screws (Figure 18, Item 2) retaining pulley (Figure 18, Item 1) to clutch assembly. Remove pulley.

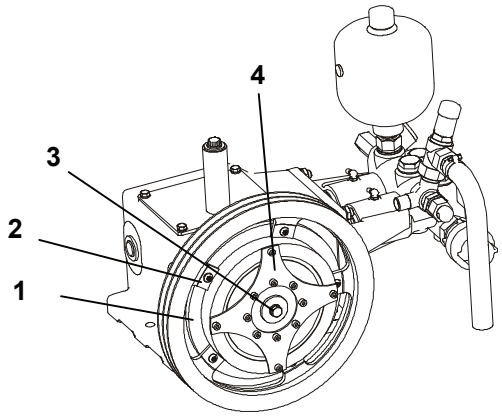


Figure 18. Water Pump Assembly.

WATER PUMP CLUTCH ASSEMBLY REMOVAL - CONTINUED

NOTE

In some instances, you may have to lightly tap the magnet assembly with a soft face hammer to remove it from the pump.

17. Loosen and remove clutch center retaining bolt and washers (Figure 18, Item 3).
18. Remove counter-magnet assembly (Figure 18, Item 4).
19. Loosen and remove the four screws (Figure 19, Item 1) that retain magnet assembly (Figure 19, Item 2).
20. Remove magnet assembly (Figure 19, Item 2).

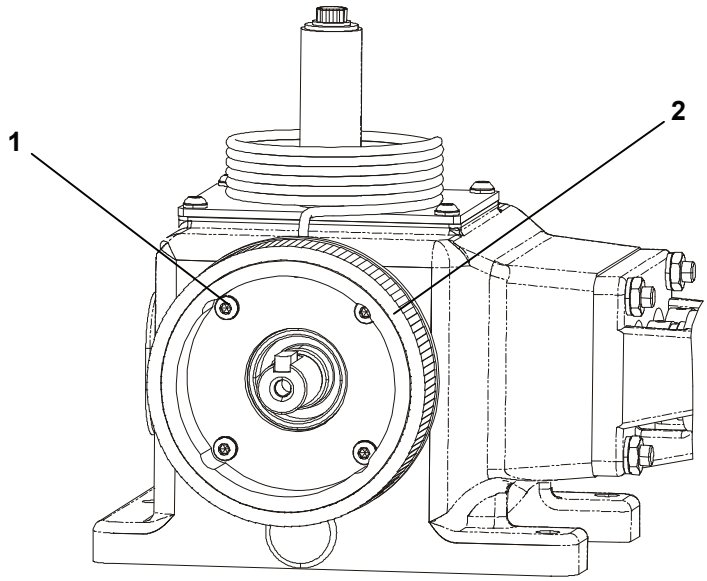


Figure 19. Magnet Assembly

END OF TASK

WATER PUMP CLUTCH ASSEMBLY INSTALLATION

1. Install magnet assembly (Figure 19, Item 2) onto water pump housing with electrical wires facing up.
2. Align mounting holes and install four retaining screws (Figure 19, Item 1). Tighten screws.
3. Install counter-magnet (Figure 18, Item 4) onto pump shaft and secure with retaining screw and washers (Figure 18, Item 3).
4. Install V-belt pulley (Figure 18, Item 1) and secure with five screws (Figure 18, Item 2).
5. Install new V-belt set onto engine pulley and onto water pump pulley.
6. Align and mount blower mounting plate to engine using spacers and bolts. Do not tighten bolts.
7. Install blower V-belt on engine pulley.

WATER PUMP CLUTCH ASSEMBLY INSTALLATION

8. Deflection should be no more than 1/4 inch at midpoint between pulleys.
9. Tighten three blower mounting plate bolts.
10. Install blower V-belt cover. Secure with two nuts and lock washers and tighten
11. Adjust water pump V-belt tension by turning adjustment nuts (Figure 19, Item 2) evenly until there is a 1/4 inch deflection in belts. Deflection should be no more than 1/4 inch at midpoint between pulleys.
12. Secure water pump adjustment nuts (Figure 20, Item 2) using locking nuts (Figure 20, Item 1) tightened against adjustment nuts (Figure 20, Item 2).
13. Tighten three hex-nuts (Figure 20, Item 3).
14. Install V-belt protective cover (Figure 20, Item 4) and secure with one screw and two washers.

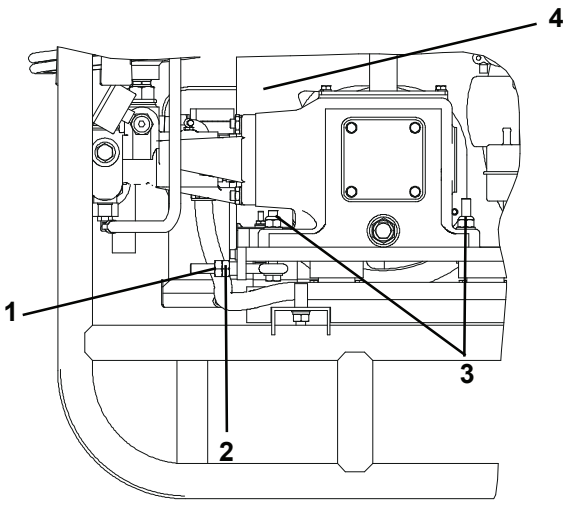


Figure 20. V-Belt Assembly.

15. Install bushing, screw, and nut. Tighten screw, and nut.
16. Install hex nut and lock washer on side of V-belt protective cover and tighten
17. Locate water pump clutch assembly wire connection (Figure 16, Item 2) on X1 terminal.
18. Feed wires through wire isolator (Figure 16, Item 1) and tighten isolator nut.
19. Connect brown wire to position 29 and blue wire to position 33 on X1 terminal and tighten recessed screw (Figure 16, Item 2) to retain wires.
20. Install cable ties on 12V wires.
21. Install control box rear panel (Figure 7, Item 2). Secure rear panel with five screws(Figure 7, Item 1). Tighten screws.

WATER PUMP CLUTCH ASSEMBLY INSTALLATION-CONTINUED

22. Install control box top cover (Figure 6, Item 2)
23. Tighten four bolts (Figure 6, Item 2) securing top cover.
24. Add oil to water pump (WP 0009).
25. Replace calcium inhibitor container.
26. Install battery in battery tray and secure with hold down straps (Figure 15, Item 4).
    a. Install terminal protective covers on battery terminals (Figure 15, Item 2).
    b. Attach positive terminal connector (Figure 15, Item 5).
    c. Attach negative terminal connector (Figure 15, Item 3).
    d. Close terminal protective covers (Figure 15, Item 2).

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
WATER PUMP V-BELT AND BLOWER V-BELT ADJUSTMENT/REPLACEMENT

INITIAL SETUP:

Test Equipment
Not Applicable

Personnel Required
Equipment Repairer/Mechanic

Tools
Tool Kit, General Mechanic (WP 0082, Item 2)
Bit, star-head (WP 0082, Item 3)

References

Materials/Parts
Belt Set, V (1) (WP 0069, Item 38)
Belt, V (1) (WP 0070, Item 14)
Accessory Kit (WP 00082, Item 1)

Equipment Condition
Applicator module set on level ground
Ensure system pressure is relieved
Fuel can removed
Engine off

WATER PUMP V-BELT ADJUSTMENT

1. Disconnect applicator module battery.
   a. Unclip negative terminal protective cover.
   b. Remove negative terminal connector and protective cover from battery.
2. Remove one screw and two washers (one flat and one lock) securing V-belt protective cover (Figure 1 Item 4).
3. Remove bolt, nut, and bushing from front of V-belt protective cover (Figure 1, Item 4).
4. Remove hex nut and lock washer from side of V-belt protective cover(Figure 1, Item 4).
5. Remove V-belt protective cover (Figure 1, Item 4).
6. Check tension of V-belt by pressing down at midpoint between pulleys. Deflection should be no more than 1/4 inch at midpoint between pulleys. If more than 1/4 inch of deflection is present, continue V-belt adjustment.

.

WATER PUMP V-BELT ADJUSTMENT - CONTINUED

7. Loosen, but do not remove, three hex-nuts (Figure 1, Item 3).

8. Loosen two adjustment screws (Figure 1, Item 2) and two locking nuts (Figure 1, Item 1).

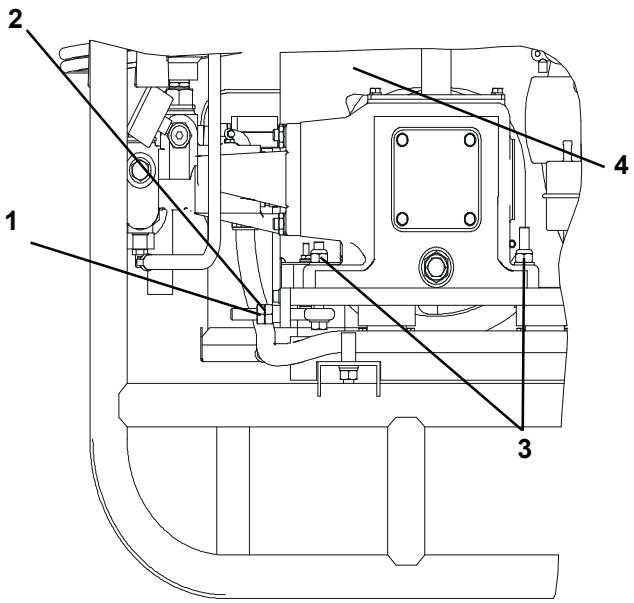


Figure 1. V-Belt Assembly - Adjustment.

9. Turn adjustment nuts (Figure 1, Item 2) to the right until V-belt can still be pressed down by 1/4 inch at midpoint between pulleys.

10. Tighten locking nut (Figure 1, Item 1) to adjustment nut (Figure 1, Item 2).

11. Tighten three hex-nuts (Figure 1, Item 3).

12. Check tension of V-belt.

13. Reinstall V-belt protective cover (Figure 1, Item 4).

2. Connect applicator module battery.

a. Install negative terminal protective cover on battery terminal.

b. Attach negative terminal connector.

c. Close terminal protective cover.

END OF TASK

WATER PUMP V-BELT REMOVAL

WARNING

ELECTRICAL CHEMICAL EYE PROTECTION

Always disconnect battery cables before performing maintenance to prevent electrical shock which could cause injury or death. Always wear eye protection and protective gloves when handling the battery.

1. Disconnect and remove battery.
   a. Unclip terminal protective covers (Figure 2, Item 2).
   b. Remove negative terminal connector (Figure 2, Item 3) and protective cover from battery.
   c. Remove positive terminal connector (Figure 2, Item 5).and protective cover from battery.
   d. Loosen battery hold down straps (Figure 2, Item 4). and lift battery from tray using attached handle (Figure 2, Item 1).

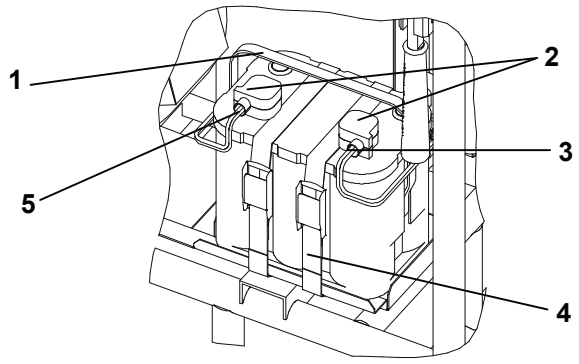


Figure 2. Battery

2. Remove one screw and two washers (one flat and one lock) securing V-belt protective cover (Figure 3 Item 4).
3. Remove screw, nut, and bushing from front of V-belt protective cover (Figure 3, Item 4).
4. Remove hex nut and lock washer from side of V-belt protective cover (Figure 3, Item 4).
5. Remove V-belt protective cover (Figure 3, Item 4).
6. Loosen three hex-nuts (Figure 3, Item 3).
7. Loosen two locking nuts (Figure 3, Item 1).

REMOVAL - CONTINUED

8. Loosen two adjustment nuts (Figure 3, Item 2).

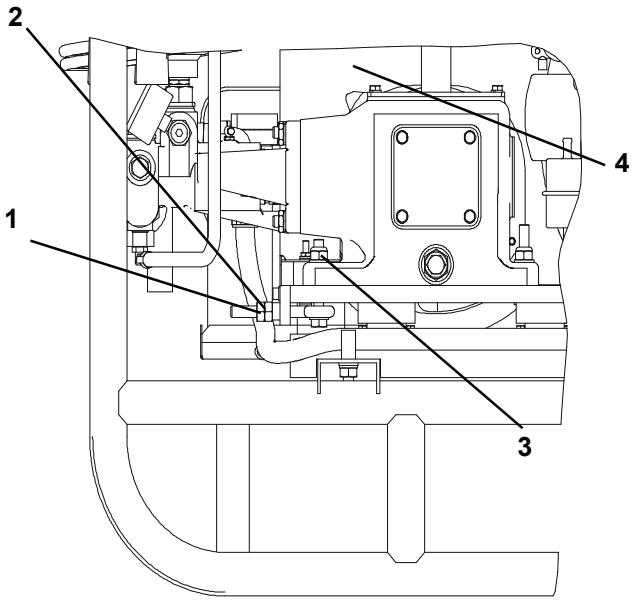


Figure 3. V-Belt Assembly – Removal.

9. Move water pump toward engine to loosen V-belts.
10. Remove two nuts (Figure 4, Item 2) from blower V-belt cover and remove cover (Figure 4, Item 3).
11. Loosen and remove three mounting bolts, lock washers (Figure 4, Item 1) and spacers that attach blower mounting plate to engine, while supporting blower. Slide blower mounting plate to the left to loosen V-belt.
12. Remove blower V-belt from engine pulley.
13. Remove water pump V-belts.

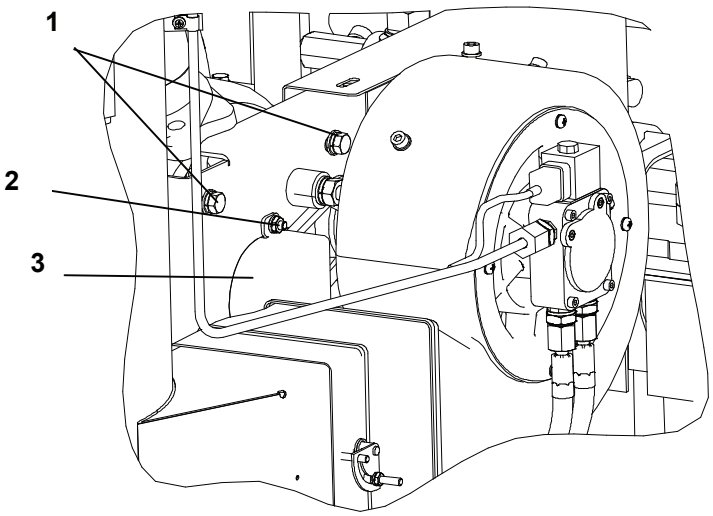


Figure 4. Blower Assembly (Cover Removed).

END OF TASK

WATER PUMP V-BELT INSTALLATION

1. Install new V-belt set onto engine pulley and onto water pump pulley.
2. Align and mount blower mounting plate to engine using spacers and bolts. Do not tighten bolts.
3. Install blower V-belt on engine pulley.
4. Adjust blower V-belt tension by sliding blower mounting plate to the right until 1/8 to 1/4 inch deflection is achieved.
5. Tighten three blower mounting plate bolts (Figure 4, Item 1).
6. Install blower V-belt cover. Secure with two nuts and lock washers and tighten
7. Check tension of V-belt by pressing down at midpoint between pulleys. Deflection should be no more than 1/4 inch at midpoint between pulleys. If more than 1/4 inch of deflection is present, continue V-belt adjustment.
8. Secure water pump adjustment nuts (Figure 5, Item 2) using locking nuts (Figure 5, Item 1) tightened against adjustment nuts (Figure 5, Item 2).
9. Tighten three hex-nuts (Figure 5, Item 3).
10. Install V-belt protective cover (Figure 5, Item 4) and secure and tighten with one screw and two washers.

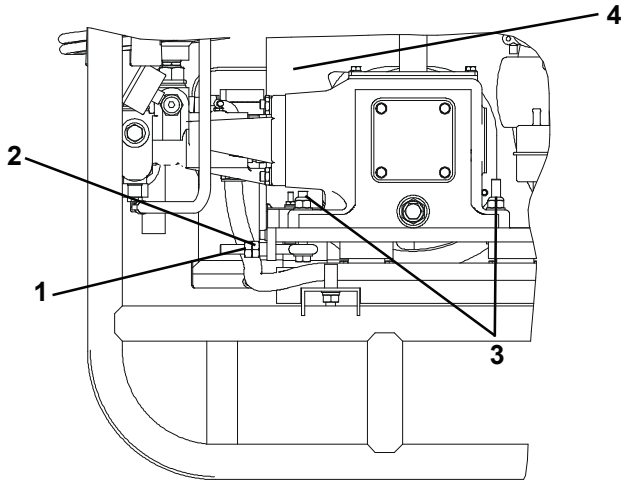


Figure 5. V- Belt Assembly - Installation.

11. Install bushing, screw, and nut. Tighten screw, and nut.
12. Install hex nut and lock washer on side of V-belt protective cover and tighten.
13. Install battery in battery tray and secure with hold down straps (Figure 2, Item 4).
    a. Install terminal protective covers on battery terminals (Figure 2, Item 2).
    b. Attach positive terminal connector (Figure 2, Item 5).
    c. Attach negative terminal connector (Figure 2, Item 3).
    d. Close terminal protective covers (Figure 2, Item 2).

END OF TASK

BLOWER V-BELT ADJUSTMENT

1. Disconnect and remove battery.
   a. Unclip terminal protective covers (Figure 2, Item 2).
   b. Remove negative terminal connector and protective cover from battery (Figure 2, Item 3).
   c. Remove positive terminal connector and protective cover from battery (Figure 2, Item 5).
   d. Loosen battery hold-down straps (Figure 2, Item 4) and lift battery from tray using the attached handle (Figure 2, Item 1).
2. Loosen three screws (Figure 6, Item 2) on protective cover (Figure 6, Item 3) of blower.
3. Remove two nuts (Figure 7, Item 1) from blower V-belt cover (Figure 7, Item 2). Remove small cover (Figure 7, Item 2).

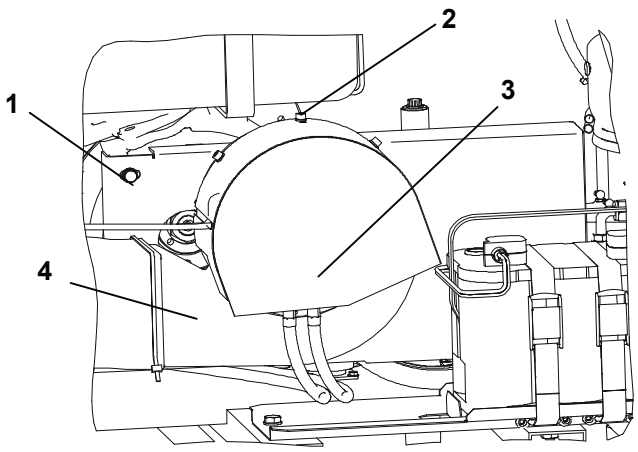


Figure 6. Blower Assembly.

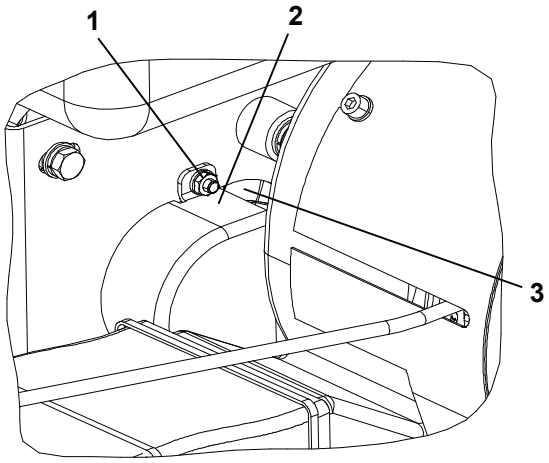


Figure 7. Blower V-Belt Cover Assembly.

4. Loosen three mounting bolts and spacers (Figure 6, Item 1) securing blower mounting plate to engine.
5. Slide blower assembly (Figure 6, Item 4) right until V-belt can still be pressed down by 1/8 to 1/4 inch.
6. Tighten three mounting bolts (Figure 6, Item 1).
7. Check tension of V-belt (Figure 7, Item 3).
8. Mount small blower V-belt cover (Figure 7, Item 2). Secure with two nuts (Figure 7, Item 1).
9. Remount protective cover (Figure 6, Item 3) of blower and tighten three screws (Figure 6, Item 2).
10. Install battery in battery tray and secure with hold down straps (Figure 2, Item 4).
    a. Install terminal protective covers on battery terminals (Figure 2, Item 2)
    b. Attach positive terminal connector (Figure 2, Item 5).
    c. Attach negative terminal connector (Figure 2, Item 3).
    d. Close terminal protective covers (Figure 2, Item 2).

END OF TASK

BLOWER V-BELT REMOVAL

1. Disconnect and remove battery.
   a. Unclip terminal protective covers (Figure 2, Item 2).
   b. Remove negative terminal connector and protective cover from battery (Figure 2, Item 3).
   c. Remove positive terminal connector and protective cover from battery. (Figure 2, Item 5)
   d. Loosen battery hold-down straps (Figure 2, Item 4) and lift battery from tray using the attached handle (Figure 2, Item 1.
2. Loosen three screws (Figure 6, Item 2) on protective cover (Figure 6, Item 3) of blower and remove cover.
3. Remove two nuts and lock washers (Figure 7, Item 1) retaining small blower V-belt cover (Figure 7, Item 2). Remove small cover (Figure 7, Item 2).
4. Loosen three mounting bolts (Figure 6, Item 1) securing blower mounting plate to engine.
5. Slide blower assembly (Figure 6, Item 4) left.
6. Remove blower V-belt from engine pulley.
7. Remove three nuts and lock washers securing blower to blower mounting plate.
8. Separate blower from blower mounting plate.
9. Remove blower V-belt (Figure 7, Item 3) from blower pulley.

END OF TASK

BLOWER V-BELT INSTALLATION

1. Install blower V-belt (Figure 7, Item 3) onto engine pulley and blower pulley.
2. Install blower assembly onto blower mounting plate.
3. Install three blower mounting nuts and lock washers (Figure 6, Item 1) securing blower to mounting plate. Tighten nuts.
4. Slide blower assembly (Figure 6, Item 4) right until V-belt (Figure 6, Item 3) can still be pressed down 1/8 inch to 1/4 inch.
5. Tighten three mounting bolts (Figure 6, Item 1). Check tension of V-belt (Figure 7, Item 3).
6. Install small blower V-belt cover (Figure 7, Item 2) and secure with two nuts and lock washers (Figure 7, Item 1).
7. Install protective blower cover (Figure 6, Item 3) and secure with three screws (Figure 6, Item 2).
8. Install battery in battery tray and secure with hold down straps (Figure 2, Item 4).
   a. Install terminal protective covers on battery terminals (Figure 2, Item 2)
   b. Attach positive terminal connector (Figure 2, Item 5).
   c. Attach negative terminal connector (Figure 2, Item 3).
   d. Close terminal protective covers (Figure 2, Item 2).

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
WATER PRESSURE GAUGE REPLACEMENT

INITIAL SETUP:

Test Equipment
Not Applicable

Tools
Tool Kit, General Mechanic (WP 0082, Item 2)

Materials/Parts
Gauge, pressure (WP 0069, Item 18)
Tape, Teflon (WP 0083, Item 14)

Personnel Required
Equipment Repairer/Mechanic

References
TM 3-4230-238-10

Equipment Condition
Ensure system pressure is relieved
Engine off

REMOVAL

WARNING

HIGH PRESSURE **EYE PROTECTION**

Contents under high pressure in equipment can cause serious bodily injury when the pressure is not properly released before handling the equipment.

Wear eye protection and protective clothing when handling equipment under high pressure.

1. Loosen and remove water pressure gauge counterclockwise (Figure 1, Item 1).
2. Discard defective water pressure gauge (Figure 1, Item 1).

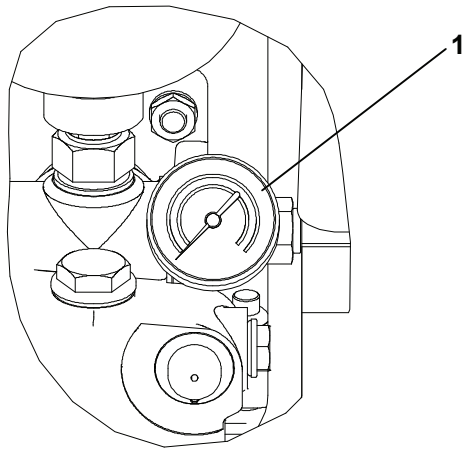


Figure 1. Water Pressure Gauge - Removal.

INSTALLATION

1. Place 2-3 wraps of Teflon tape, in a clockwise motion, on installation threads of water pressure gauge (Figure 2, Item 1).
2. Turn water pressure gauge (Figure 2, Item 1) clockwise until gauge is tight and can be read without difficulty.
3. Perform normal water dispensing operations (Operator's Manual, WP 0008) and check for leaks.

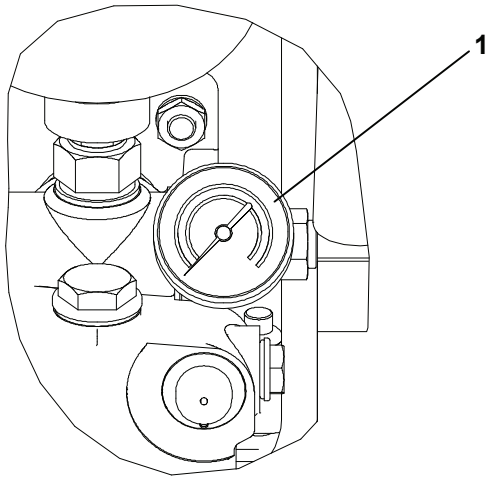


Figure 2. Water Pressure Gauge - Installed.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
HIGH-PRESSURE INPUT AND OUTPUT HOSE REPLACEMENT

INITIAL SETUP:

Test Equipment
Not Applicable

Tools
Tool Kit, General Mechanic (WP 0082, Item 2)

Materials/Parts
Hose Assembly (1) (WP 0072, Item 6)
Hose Assembly (1) (WP 0072, Item 7)
Accessory Kit, (WP 0082, Item 1)

Personnel Required
Equipment Repairer/Mechanic

References
TM 3-4230-238-10

Equipment Condition
Ensure system pressure is relieved
Engine off

HIGH-PRESSURE INPUT HOSE REMOVAL

WARNING

HIGH PRESSURE **EYE PROTECTION**

Contents under high pressure in equipment can cause serious bodily injury when the pressure is not properly released before handling the equipment.

Wear eye protection and protective clothing when handling equipment under high pressure.

1. Remove input hose (Figure 1, Item 1) from water safety valve (Figure 1, Item 2).
2. Follow hose to opposite end, on side of safety system (Figure 2, Item 1).

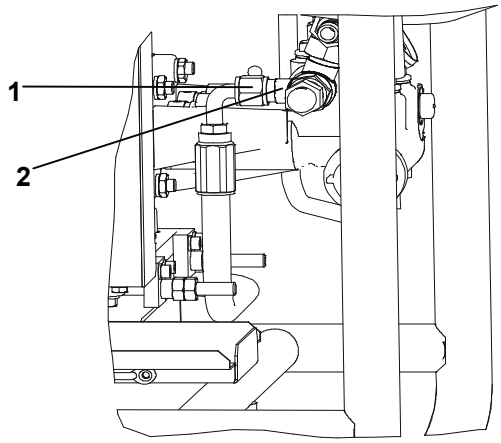


Figure 1. Safety Valve.

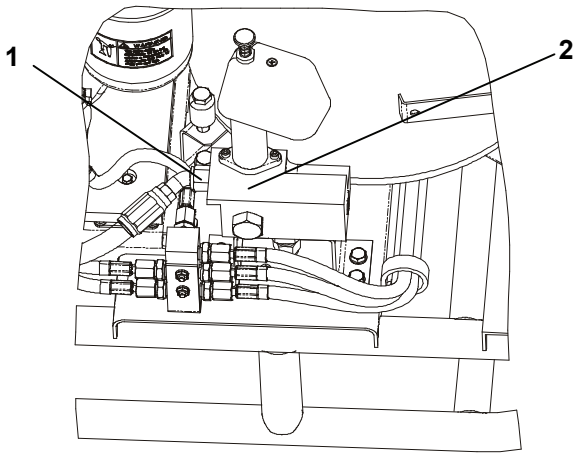


Figure 2. Safety System.

HIGH-PRESSURE INPUT HOSE REMOVAL - CONTINUED

3. Remove input hose (Figure 2, Item 1) from safety system (Figure 2, Item 2) using wrench from accessory kit.
4. Discard high-pressure input hose.

END OF TASK

HIGH-PRESSURE INPUT HOSE INSTALLATION

1. Install input hose (Figure 3, Item 1) to safety valve (Figure 3, Item 2).
2. Install input hose (Figure 4, Item 1) to safety system (Figure 4, Item 2).
3. Place new hose into frame mounted retaining clips.
4. Perform normal water dispensing operations and check for leaks (Operator's Manual, WP 0008).

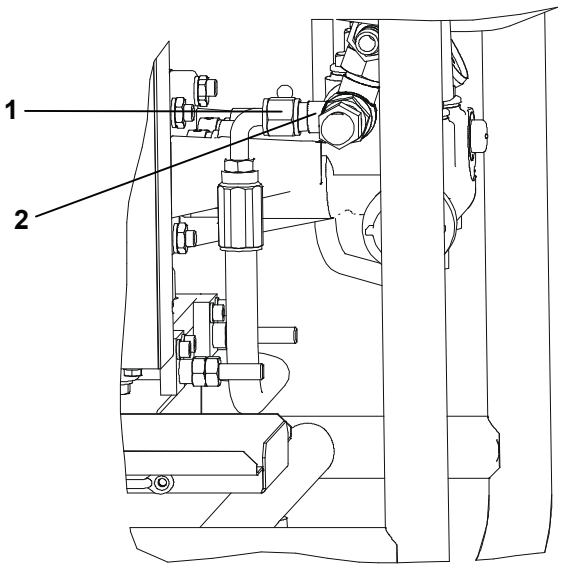


Figure 3. Safety Valve.

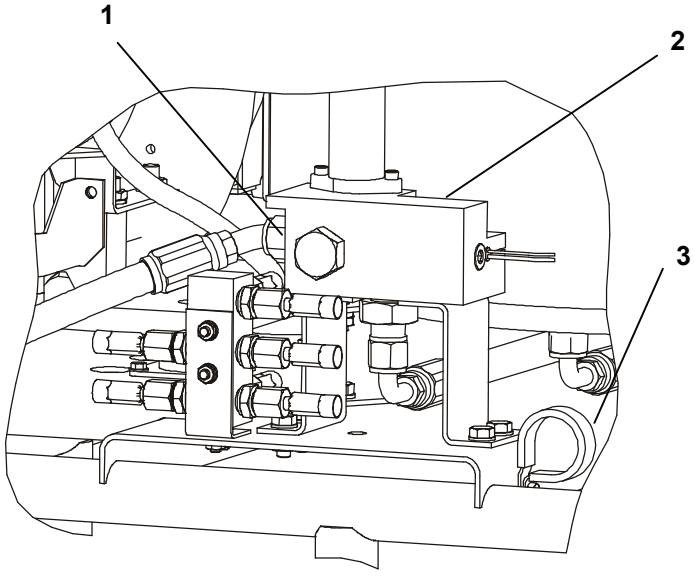


Figure 4. Safety System.

END OF TASK

HIGH-PRESSURE OUTPUT HOSE REMOVAL

NOTE

Hold bolt on back side while removing nut which secures fuel line junction assembly.

HIGH-PRESSURE OUTPUT HOSE REMOVAL-CONTINUED

1. Remove two bolts, nuts and washers (Figure 5, Item 1) securing fuel line junction assembly (Figure 5, Item 2) to fuel line junction mounting bracket (Figure 5, Item 3).
2. Remove fuel line cushion clamp (Figure 5, Item 6)
3. Move fuel line junction assembly (Figure 5, Item 2) to gain access to output hose fitting (Figure 5, Item 5).
4. Remove output hose (Figure 5, Item 5) from safety system (Figure 5, Item 4) using wrench from accessory kit.

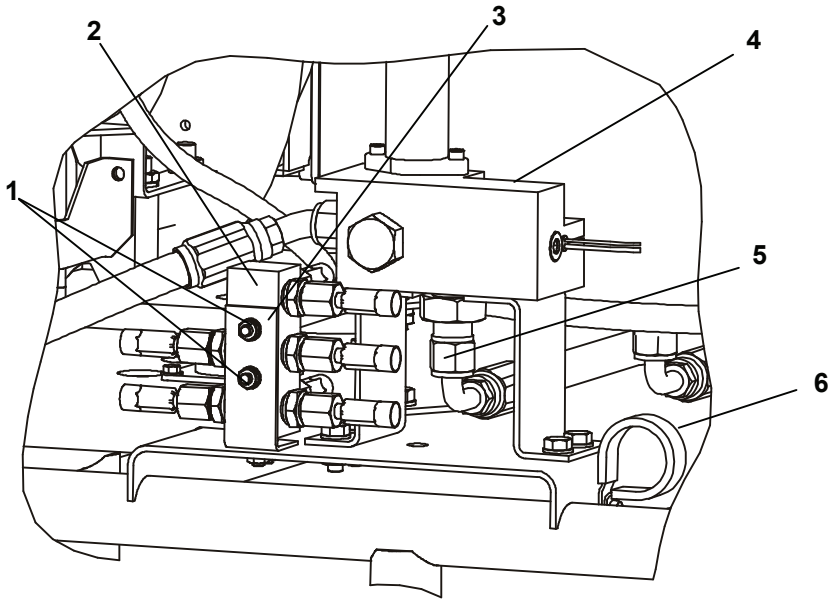


Figure 5. Fuel Line Junction Assembly - Fuel Lines Removed

5. Remove output hose (Figure 6, Item 2) from bottom of burner housing (Figure 6, Item 1) and discard.

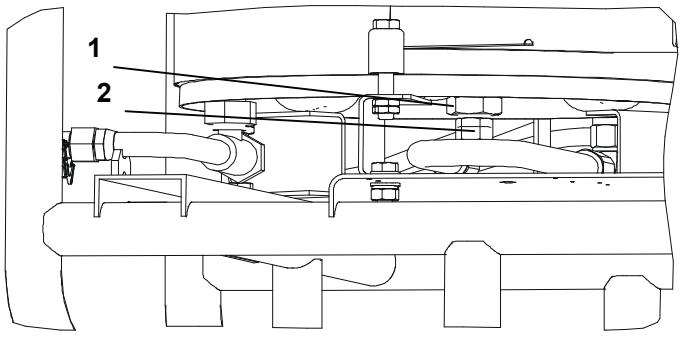


Figure 6. Burner Assembly.

END OF TASK

HIGH-PRESSURE OUTPUT HOSE INSTALLATION

1. Install output hose (Figure 7, Item 2) to bottom of burner housing (Figure 7, Item 1).

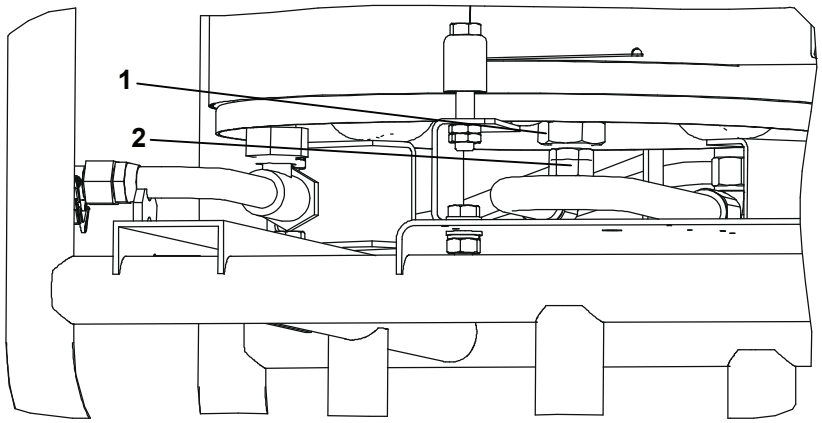


Figure 7. Burner Assembly - Installation.

2. Install output hose (Figure 8, Item 1) to safety system (Figure 8, Item 2) using wrench from accessory kit.

3. Reinstall cushion clamp (Figure 8, Item 3).

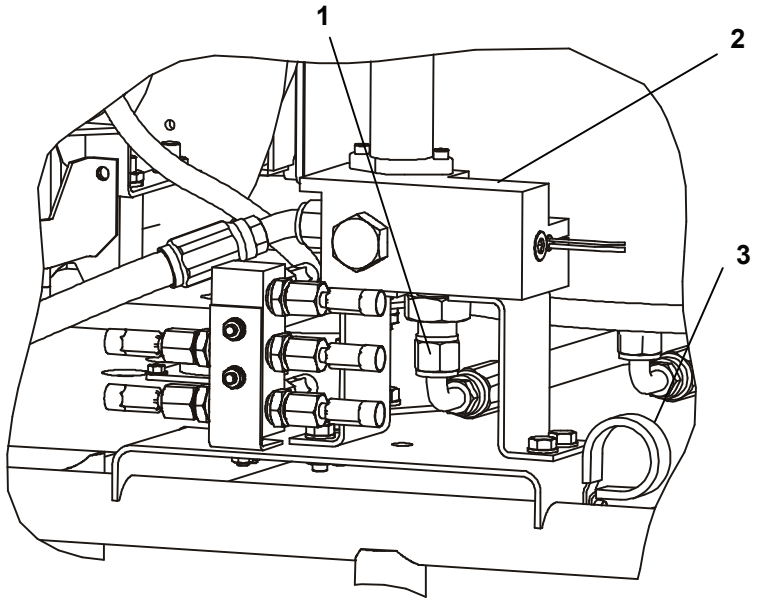


Figure 8. Output Hose Installation – Fuel Lines Removed.

HIGH-PRESSURE OUTPUT HOSE INSTALLATION - CONTINUED

NOTE

Hold bolt on back side while installing nut which secures fuel line junction assembly.

4. Install the two bolts, nuts and washers (Figure 9, Item 1) securing fuel line junction assembly (Figure 9, Item 2) to fuel line junction mounting bracket (Figure 9, Item 3).

5. Perform normal water dispensing operations and check for leaks (Operator's Manual, WP 0008).

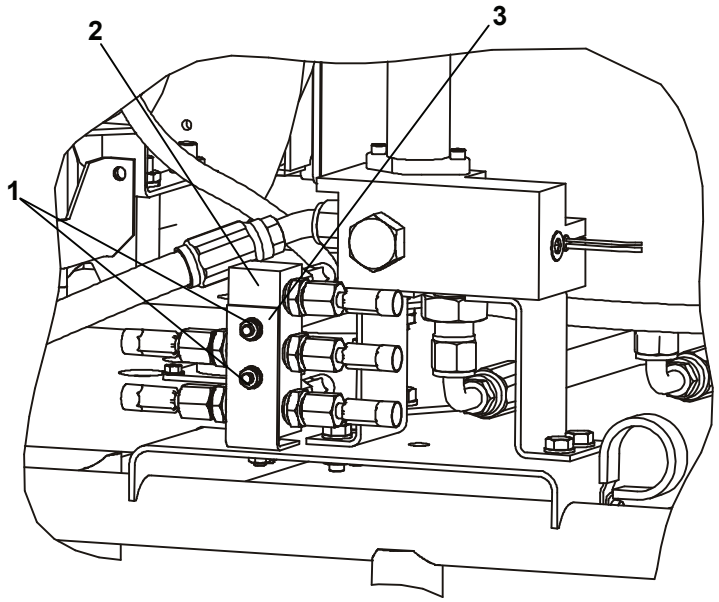


Figure 9. Fuel Line Junction Assembly – Installation.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
SAFETY VALVE TESTING AND REPLACEMENT

INITIAL SETUP:

Test Equipment
Not Applicable

Tools
Tool Kit, General Mechanic (WP 0082, Item 2)

Materials/Parts
Valve, Safety Relief (WP 0069, Item 23)
Cloth, Cleaning (WP 0083, Item 3)
Tape, Teflon (WP 0083, Item 14)

Personnel Required
Equipment Repairer/Mechanic

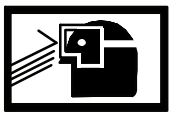
References
TM 3-4230-238-10

Equipment Condition
Applicator module set on level ground
Ensure system pressure is relieved

TESTING

WARNING

HIGH PRESSURE


EYE PROTECTION

Contents under high pressure in equipment can cause serious bodily injury when the pressure is not properly released before handling the equipment.

Wear eye protection and protective clothing when handling equipment under high pressure.

NOTE

The use of chemicals or soaps is not required for testing of the safety valve.

1. To test safety valve (Figure 1, Item 1), set up and operate equipment (Operator's Manual, WP 0006 and WP 0008).

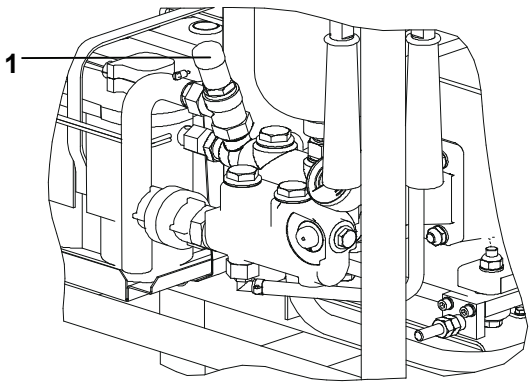


Figure 1. Pump Assembly.

TESTING - CONTINUED

2. With applicator module operating in cold-water mode and water pressure gauge reading between 870 and 1000 PSI (60 and 69 BAR), squeeze hand spray gun to dispense water.
3. Observe safety valve for leakage:
   a. A small amount of water may drip from safety valve when trigger assembly has been released. This is normal as pressure is relieved at water pump head assembly.
   b. A continuous small stream of water that does not affect water pressure is acceptable.
   c. If there is a continuous flow of water great enough to affect amount of water pressure, safety valve must be replaced.

END OF TASK

REMOVAL

WARNING

HIGH PRESSURE **EYE PROTECTION**

Contents under high pressure in equipment can cause serious bodily injury when the pressure is not properly released before handling the equipment.

Wear eye protection and protective clothing when handling equipment under high pressure.

1. Loosen hose clamp and remove angled rubber hose (Figure 2, Item 1).
2. Remove hose adapter (Figure 2, Item 2) from safety valve (Figure 2, Item 3).

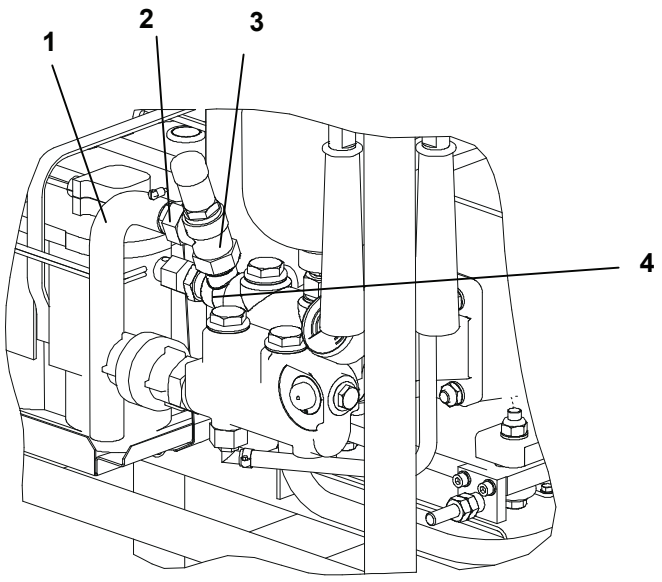


Figure 2. Pump Assembly - Front View.

REMOVAL - CONTINUED

3. Loosen and remove safety valve (Figure 2, Item 3) by turning safety valve counterclockwise until it is removed from its fixture.

END OF TASK

INSTALLATION

1. Ensure there is no debris inside of safety valve pump adapter (Figure 2, Item 4).
2. Apply two to three wrappings of Teflon tape to threads of pump adapter (Figure 2, Item 4).
   a. Install safety valve (Figure 2, Item 3) onto pump adapter turning clockwise until it is firmly seated.
   b. Tighten and ensure that outlet is facing left.
3. Apply two to three wrappings of Teflon tape to threaded end of hose adapter (Figure 2, Item 2).
4. Install and tighten adapter into safety valve (Figure 2, Item 3).
5. Install angled rubber hose and clamp with hose pointing downward.
6. Secure clamp to hose adapter (Figure 2, Item 2).
7. Test safety valve (TESTING task in this WP).

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
SAFETY SYSTEM REPLACEMENT

INITIAL SETUP:

Test Equipment
Not Applicable

Tools
Tool Kit, General Mechanic (WP 0082, Item 2)
Bit, star-head (WP 0082, Item 3)

Materials/Parts
Switch Assembly (1) (WP 0072, Item 1)
Cloth, Cleaning (WP 0083, Item 3)
Tags, Marking(WP 0083, Item 12)
Accessory Kit, (WP 0082, Item 1)

Personnel Required
Equipment Repairer/Mechanic

References
Not Applicable

Equipment Condition
Applicator module set on level ground
Ensure system pressure is relieved
Engine off

REMOVAL

WARNING

HIGH PRESSURE **EYE PROTECTION**

Contents under high pressure in equipment can cause serious bodily injury when the pressure is not properly released before handling the equipment.

Wear eye protection and protective clothing when handling equipment under high pressure.

1. Remove screw (Figure 1, Item 1) holding pressure switch cover in place.
2. Remove cover (Figure 1, Item 2) and rubber sealing gasket. Note position of spring loaded plunger.
3. Disconnect two wires from safety switch (Figure 2, Item 1). Note where wires were attached and tag wires.

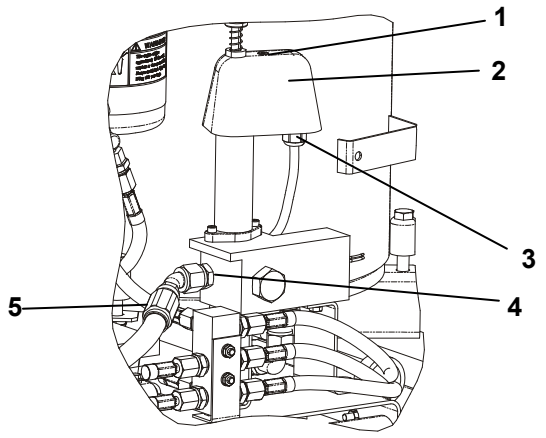


Figure 1. Safety System Assembly – Cover On.

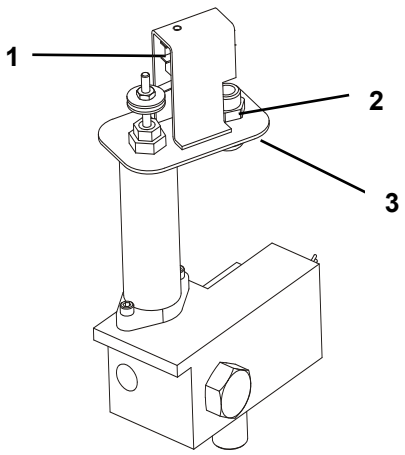


Figure 2. Safety System Assembly – Cover Off.

REMOVAL

4. Loosen nut (Figure 1, Item 3) from wiring harness and slide wires out of safety switch housing (Figure 2, Item 3).

5. Loosen screw (Figure 3, Item 7) that retains reed sensing switch (Figure 3, Item 8)

NOTE

It may be necessary to create a gap between upper and lower plates on safety system housing in order to remove reed sensing switch.

6. Slide reed sensing switch (Figure 3, Item 8) out of safety system housing (Figure 3, Item 4).

7. Remove two bolts, nuts and washers (Figure 3, Item 1) securing fuel line junction assembly (Figure 3, Item 2) to fuel line junction mounting bracket (Figure 3, Item 3).

8. Remove fuel line cushion clamp (Figure 3, Item 6).

9. Move fuel line junction assembly (Figure 3, Item 2) to gain access to output hose fitting (Figure 3, Item 5).

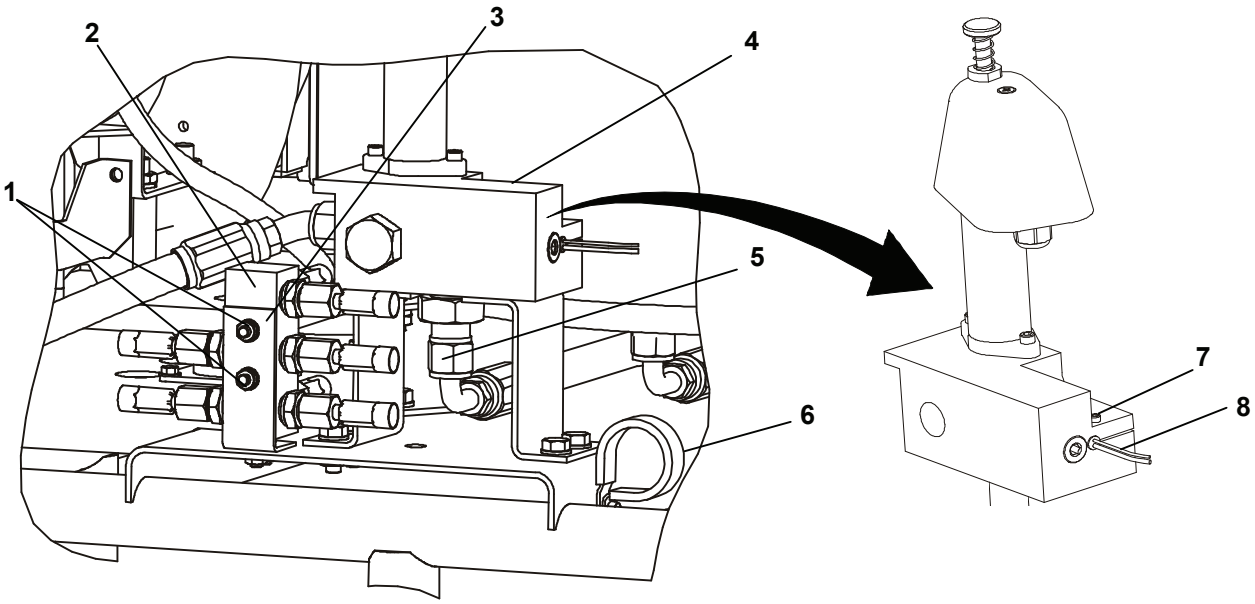


Figure 3. Fuel Line Junction Assembly – Removal.

10. Disconnect high-pressure hose (Figure 3, Item 5) from outlet bottom of safety system (Figure 3, Item 4).

REMOVAL-CONTINUED

11. Remove outlet hose adapter (Figure 4, Item 1) from safety system (Figure 4, Item 2).
12. Disconnect high-pressure hose (Figure 1, Item 5) from inlet side of safety system (Figure 4, Item 2).
13. Remove inlet hose adapter (Figure 1, Item 4) from safety system.
14. Remove three hex bolts and lock washers (Figure 4, Item 3) attaching safety system (Figure 4, Item 2) to mounting plate (Figure 4, Item 4).
15. Remove safety system (Figure 4, Item 2).

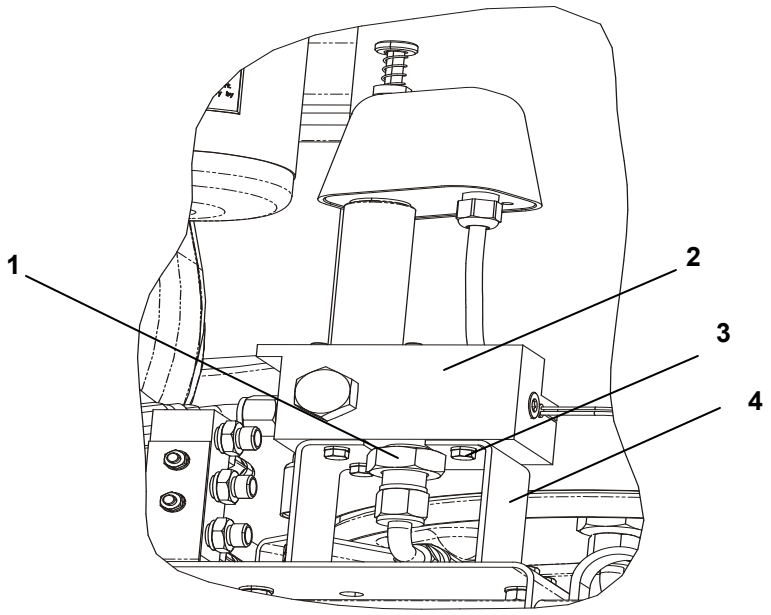


Figure 4. Safety System Mounting.

END OF TASK

INSTALLATION

1. Install inlet (Figure 1, Item 4) and outlet (Figure 4, Item 1) high-pressure hose adapters to safety system housing (Figure 4, Item 2). The inlet adapter is the smaller adapter.
2. Mount safety system onto mounting plate (Figure 4, Item 4) and install three hex bolts and lock washers (Figure 4, Item 3) before tightening.
3. After positioning safety system, tighten hex bolts.
4. Install high-pressure hose to outlet (Figure 5, Item 5) and high-pressure hose to inlet (Figure 1, Item 5). Tighten hoses.
5. Reposition fuel line junction assembly (Figure 5, Item 2) that was moved in order to gain access to the output hose fitting (Figure 5, Item 5).
6. Install two bolts, nuts and washers (Figure 5, Item 1) securing fuel line junction assembly (Figure 5, Item 2) to fuel line junction mounting bracket (Figure 5, Item 3).
7. Install fuel line cushion clamp (Figure 5, Item 6).
8. Insert reed sensing switch (Figure 5, Item 8) into safety system (Figure 5, Item 4). Tighten screw (Figure 5, Item 7).

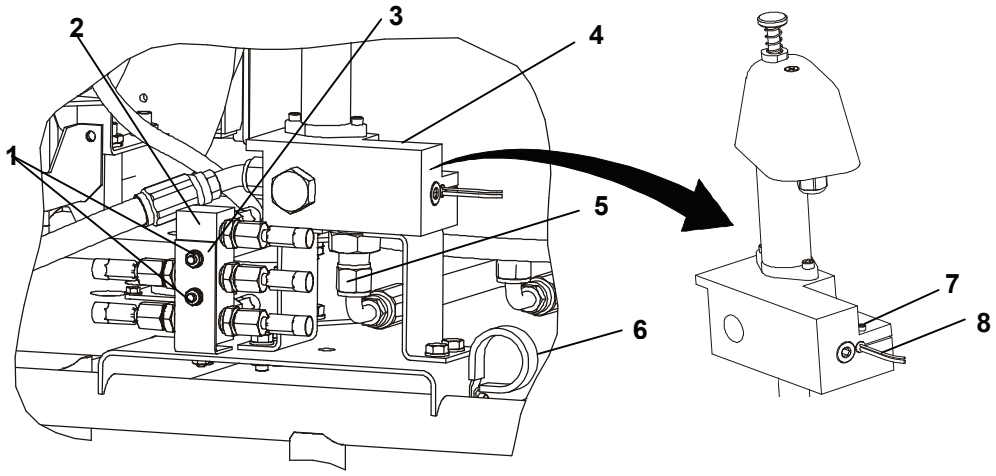


Figure 5. Fuel Line Junction Assembly – Installation.

9. Loosen and remove screw (Figure 1, Item 1) securing safety switch cover (Figure 1, Item 2). Remove cover and rubber sealing gasket.
10. Install safety switch wiring harness (Figure 2, Item 2) thru safety switch. Once there is a sufficient length of each wire pulled through to connect to safety switch, tighten retaining nut.
11. Remove tags and attach safety switch wires as previously marked during removal.
12. Attach rubber sealing gasket and top cover. Note position of the spring loaded plunger on the safety switch cover (Figure 1, Item 2). The cover should be close to engine side of switch.
13. Secure pressure switch cover with screw (Figure 1, Item 1).

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
PULSATION DAMPER TESTING AND REPLACEMENT

INITIAL SETUP:

Test Equipment
Not Applicable

Personnel Required
Equipment Repairer/Mechanic

Tools
Tool Kit, General Mechanic (WP 0082, Item 2)
27mm Wrench (WP 0082, Item 1)

References
TM 3-4230-238-10

Materials/Parts
Tank, Pressure (1) (WP 0069, Item 3)
Gasket, Ring (1) (WP 0069, Item 4)
Accessory Kit (WP 0082, Item 1)

Equipment Condition
Applicator module set on level ground

TESTING

WARNING

HIGH PRESSURE **EYE PROTECTION**

Contents under high pressure in equipment can cause serious bodily injury when the pressure is not properly released before handling the equipment.

Wear eye protection and protective clothing when handling equipment under high pressure.

1. Put equipment into operation so that pressure is built up in water system of applicator module (Operator's Manual, WP 0008).
2. Set selector switch to STOP (Figure 1, Item 1).
3. Set throttle lever (Figure 1, Item 2) to the stop position.

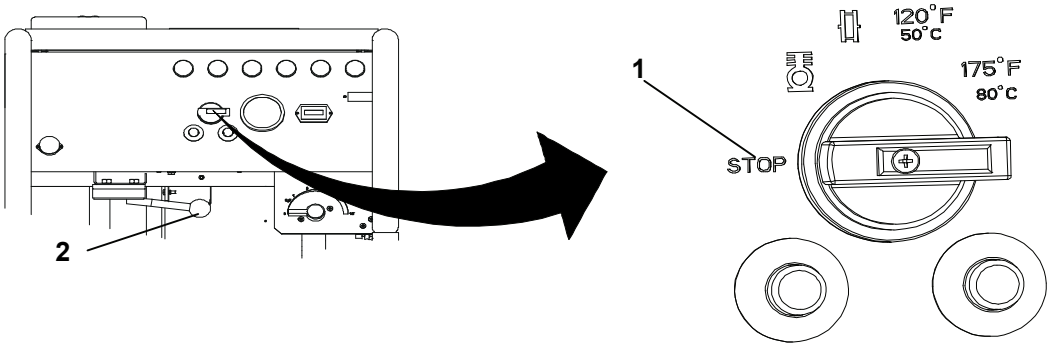


Figure 1. Control Panel Assembly.

TEST - CONTINUED

4. With system pressurized, lightly depress trigger of spray gun (to simulate a slight leak in the system).

NOTE

Pulsation damper (Figure 2, Item 1) pressure is indicated when the pressure gauge (Figure 2, Item 2) needle quickly falls to a zero reading.

5. Observe pressure reading on pressure gauge (Figure 2, Item 2).
   a. If the pressure reading observed is between 87 PSI/ 6 BAR (high) and 30 PSI/2 BAR (low), the pulsation damper (pressure accumulator) is operational.
   b. If the pressure reading observed is less than 30 PSI/2 BAR, replace pulsation damper (pressure accumulator).

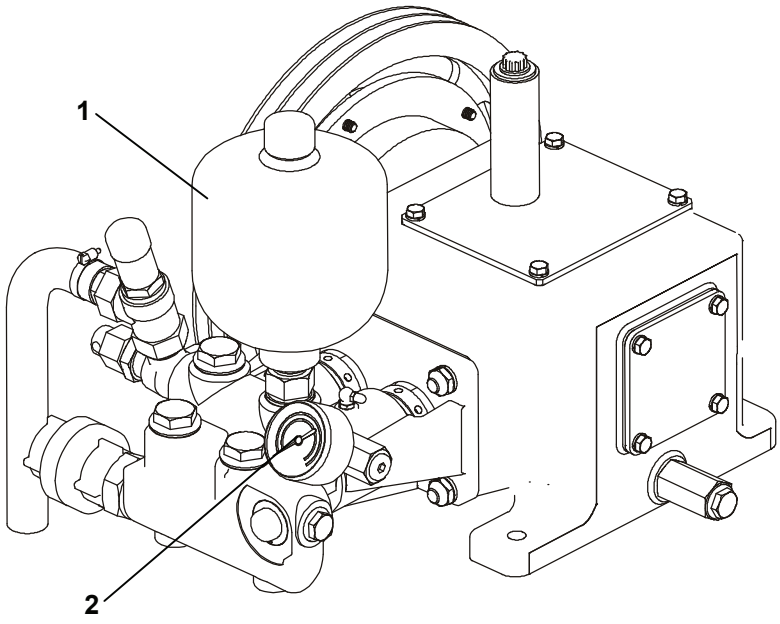


Figure 2. Water Pump Assembly - Test.

END OF TASK

REMOVAL

WARNING

HIGH PRESSURE

Ensure that the applicator module has no water pressure present prior to removal of the pulsation damper (pressure accumulator). Contents under high pressure in equipment can cause serious bodily injury when the pressure is not properly released before handling the equipment.

1. Loosen and remove pulsation damper (Figure 3, Item 1) from adapter (Figure 3, Item 3), using wrench from accessory kit.
2. Remove and discard spacing gasket (Figure 3, Item 2).

END OF TASK

INSTALLATION

1. Install new spacing gasket (Figure 3 Item 2) onto pulsation damper (Figure 3, Item 1).
2. Install pulsation damper (Figure 3, Item 1) onto adapter (Figure 3, Item 3) and tighten with wrench.

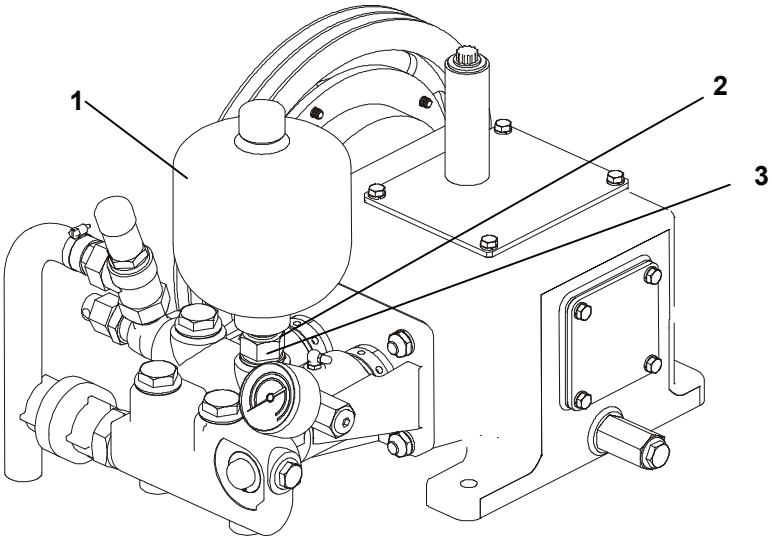


Figure 3. Water Pump Assembly - Installation.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
WATER PUMP SIGHT GLASS REPLACEMENT

INITIAL SETUP:

Test Equipment:
Not Applicable

Tools
Tool Kit, General Mechanic (WP 0082, Item 2)

Materials/Parts
Indicator, Sight, Liquid (1) (WP 0069, Item 31)
Pan, Drain (WP 0083, Item 8)
Oil, Water Pump (WP 0083, Item 7)

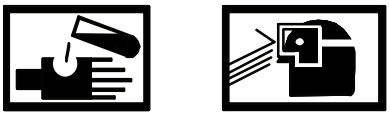
Personnel Required
Equipment Repairer/Mechanic

References:
WP 0009

Equipment Condition
Engine off and cool

REMOVAL

WARNING



CHEMICAL **EYE PROTECTION**

Excessive exposure to pump oil may result in eye, skin or respiratory irritation. Wear eye protection, protective clothing and protective gloves when handling the water pump.

1. Place drain pan under oil drain plug (Figure 1, Item 1).
2. Remove oil drain plug and washer (Figure 1, Item 1) and drain oil from pump. Reinstall drain plug and washer.
3. Using adjustable slip-joint pliers gently grasp side of sight glass (Figure 1, Item 2) turning counterclockwise until removed.
4. Discard defective sight glass (Figure 1, Item 2) and O-ring.

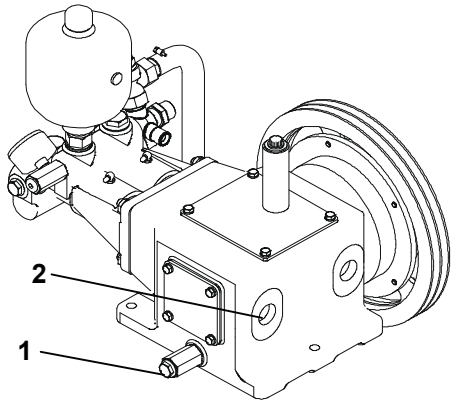


Figure 1. Water Pump Assembly - Removal.

END OF TASK

INSTALLATION

1. Lightly lubricate O-ring that is attached to new sight glass.
2. Install and hand tighten new sight glass (Figure 2, Item 2).
3. With pair of adjustable slip-joint pliers gently grasping sides of sight glass (Figure 2, Item 2), carefully tighten sight glass (Figure 2, Item 2).
4. Remove filler plug (Figure 2, Item 1).
5. Fill water pump with oil to proper level (WP 0009).
6. Observe sight glass for leaks and repeat step 2, if necessary.
7. Replace filler plug (Figure 2, Item 1).

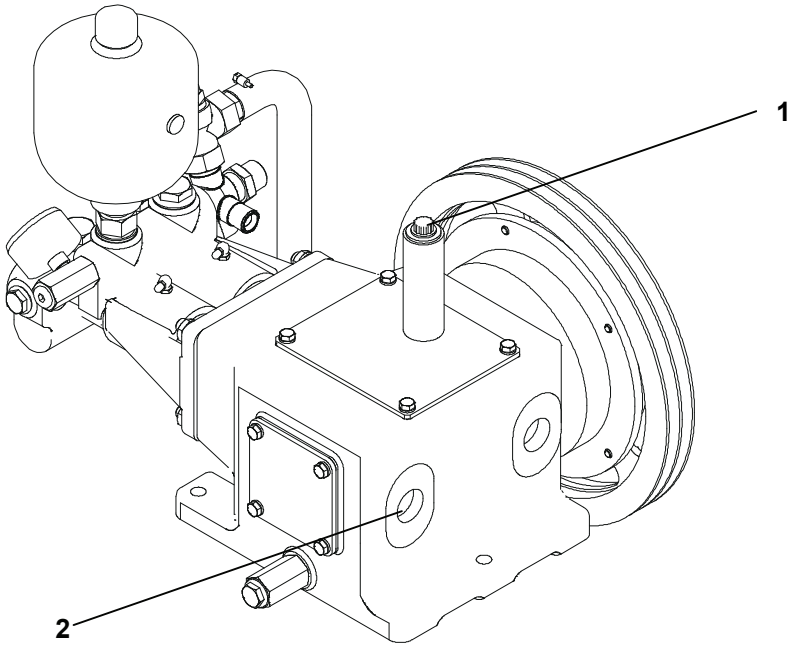


Figure 2. Water Pump Assembly - Installation.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
WATER PUMP CHECK VALVE CLEANING/REPLACEMENT

INITIAL SETUP:

Test Equipment
Not Applicable

Tools
Tool Kit, General Mechanic (WP 0082, Item 2)

Materials/Parts
Valve, Safety Relief (WP 0072, Item 12)
Cloth, Cleaning (WP 0083, Item 3)
Pan, Drain (WP 0083, Item 8)
Tape, Teflon (WP 0083, Item 14)

Personnel Required
Equipment Repairer/Mechanic

References
TM 3-4230-238-10

Equipment Condition
Applicator module set on level ground
Ensure system pressure is relieved
Engine off

REMOVAL AND CLEANING

WARNING

HIGH PRESSURE

Contents under high pressure in equipment can cause serious bodily injury when the pressure is not properly released before handling the equipment.

NOTE

Do not damage plastic ribbed elbow (Figure 1, Item 3).

1. Position drain pan under hose clamp (Figure 1, Item 2). Loosen hose clamp (Figure 1, Item 2) and remove clear plastic tubing (Figure 1, Item 1) from plastic ribbed elbow (Figure 1, Item 3). This may require rotating plastic tubing several times.
2. Loosen and remove check valve (Figure 1, Item 4) with ribbed elbow attached (Figure 1, Item 3).
3. Check for debris and if damaged replace check valve (Figure 1, Item 4).
4. If replacement is required, remove ribbed elbow (Figure 1, Item 3) by turning elbow (Figure 1, Item 3) counter-clockwise until it is removed from check valve (Figure 1, Item 4).

REMOVAL - CONTINUED

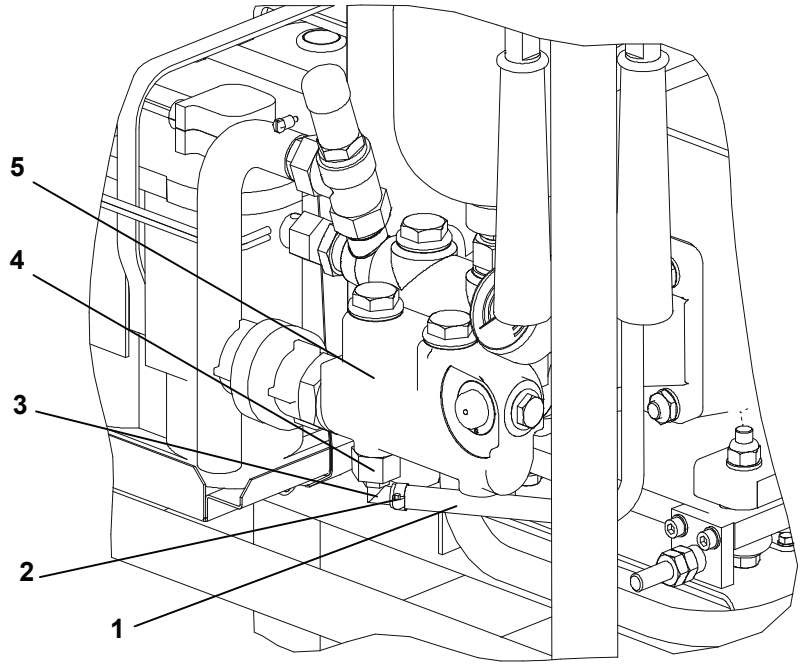


Figure 1. Pump Assembly - Front View.

END OF TASK

INSTALLATION

1. Ensure there is no debris inside of pump housing (Figure 1, Item 5).
2. Apply two to three wrappings of Teflon tape, clockwise, to threads of new check valve (Figure 1, Item 4).
3. Install check valve (Figure 1, Item 4) into the pump housing (Figure 1, Item 5) turning clockwise until it is firmly seated.
4. Apply two wrappings of Teflon tape, clockwise, to threaded end of ribbed elbow (Figure 1, Item 3).
5. Install ribbed elbow (Figure 1, Item 3) into check valve (Figure 1, Item 4). Ensure that elbow is facing right when tightened.
6. Install clear plastic tubing (Figure 1, Item 1) onto ribbed elbow (Figure 1, Item 3).
7. Secure clear plastic tubing (Figure 1, Item 1) using existing hose clamp (Figure 1, Item 2).

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
WATER PUMP VALVE CLEANING AND REPLACEMENT

INITIAL SETUP:

Test Equipment
Not Applicable

Tools
Tool Kit, General Mechanic (WP 0082, Item 2)

Materials/Parts
Valve Disk (4) (WP 0069, Item 10)
Helical, Spring (4) (WP 0069, Item 9)
Gasket (6) (WP 0069, Item 8)
Cloth, Cleaning (WP 0083, Item 3)

Personnel Required
Equipment Repairer/Mechanic

References
Not Applicable

Equipment Condition
Applicator module set on level ground
Ensure system pressure is relieved
Engine off

CLEANING/REMOVAL

WARNING

Ensure that the water system is depressurized by observing the water pressure gauge.

1. Remove three valve plugs (Figure 1, Item 2). Keep plugs separated as they are spaced differently by number of washers (Figure 1, Item 3) used.
2. Remove valve disks and springs (Figure 1, Item 4) and clean valve seats (Figure 1, Item 5). There are three valves, springs and seats to check.

CAUTION

For cleaning, do not use hard tools since this could damage the valve plates.

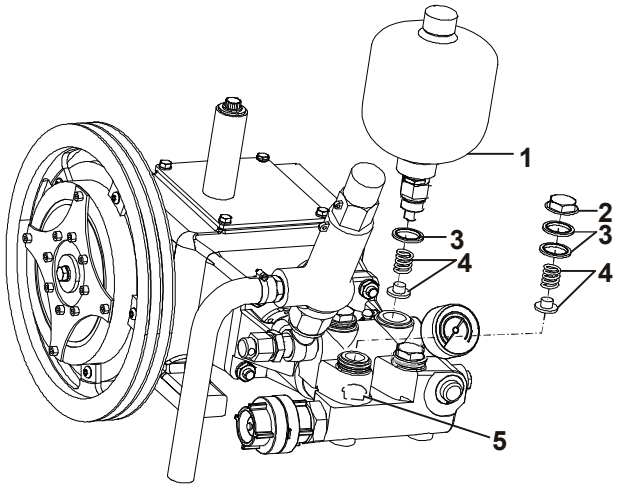


Figure 1. Water Pump Assembly.

CLEANING/REMOVAL - CONTINUED

3. Check valve disks for damage and wear. Replace heavily damaged valve disks and springs (Figure 1, Item 4).
4. Loosen and remove pulsation damper (Figure 1, Item 1).
5. Remove pulsation damper valve disk and spring (Figure 1, Item 4).
6. Check pulsation damper valve disk and spring for damage and wear. Replace heavily damaged valve disk or spring.

END OF TASK

INSTALLATION

1. Install valve disks and springs (Figure 1, Item 4) into water pump head assembly.
2. Install specific valve plug (Figure 1, Item 2) into each specific location. Replace gasket (Figure 1, Item 3) as required.
3. Tighten three valve plugs (Figure 1, Item 2).
4. Install pulsation damper (Figure 1, Item 1). Replace gasket (Figure 1, Item 3) as required.
5. Tighten pulsation damper (Figure 1, Item 1).

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
WATER PUMP FILLER/VENT MOUNTING GASKET REPLACEMENT

INITIAL SETUP:

Test Equipment
Not Applicable

Tools
Tool Kit, General Mechanic (WP 0082, Item 2)
Bit, star-head (WP 0082, Item 3)

Materials/Parts
Gasket (WP 0069, Item 15)
Cloth, Cleaning (WP 0083, Item 3)
Oil, Water pump (WP 0083, Item 7)
Accessory Kit, (WP 0082, Item 1)

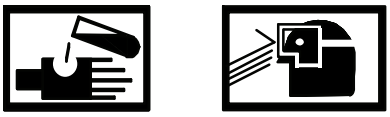
Personnel Required
Equipment Repairer/Mechanic

References
WP 0009

Equipment Condition
Engine off

REMOVAL

WARNING



CHEMICAL **EYE PROTECTION**

Excessive exposure to pump oil may result in eye, skin or respiratory irritation. Wear eye protection, protective clothing and protective gloves when handling the water pump.

1. Clean top of water pump assembly.
2. Remove four screws (Figure 1, Item 1) from filler/vent mounting plate (Figure 1, Item 2). Move throttle cable bracket and cable out of way.
3. Remove filler/vent mounting plate (Figure 1, Item 2) and discard gasket (Figure 1, Item 4).

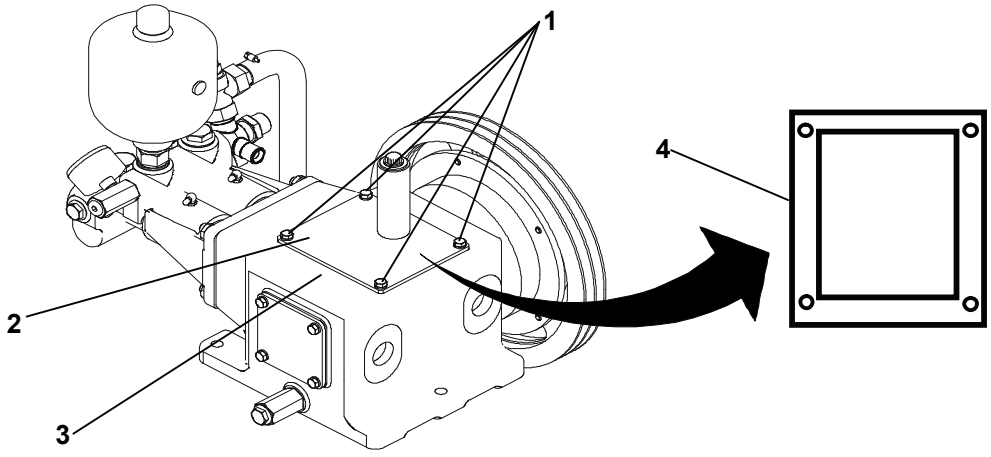


Figure 1. Water Pump Assembly.

END OF TASK

INSTALLATION

1. Clean mounting surface (Figure 1, Item 3) and filler/vent mounting plate (Figure 1, Item 2).
2. Place gasket (Figure 1, Item 4) on mounting surface (Figure 1, Item 3).
3. Align filler/vent mounting plate (Figure 1, Item 2) onto the gasket (Figure 1, Item 4). Ensure throttle cable bracket is reinstalled. Tighten four screws (Figure 1, Item 1).
4. If water pump oil level is low, fill water pump with water pump oil to proper level (WP 0009).

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
BLOWER UNIT REPLACEMENT

INITIAL SETUP:

Test Equipment
Not Applicable

Tools
Tool Kit, General Mechanic (WP 0082, Item 2)

Materials/Parts
Fan, Centrifugal (WP 0070, Item 1)
Strap, Tiedown electrical (2), (WP 0070, Item 10)
Drain Pan, (WP 0083, Item 8)
Cloth, Cleaning (WP 0083, Item 3)
Tags, Marking (WP 0083, Item 12)
Accessory Kit (WP 0082, Item 1)

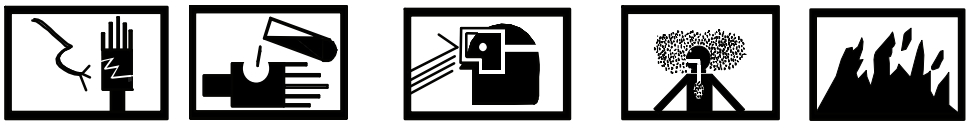
Personnel Required
Equipment Repairer/Mechanic

References
TM 3-4230-238-10

Equipment Condition
Applicator module set on level ground
Engine off and cool

REMOVAL

WARNING



ELECTRICAL CHEMICAL EYE PROTECTION VAPOR FIRE

Always disconnect battery cables before performing maintenance to prevent electrical shock which could cause injury or death. Always wear eye protection and protective gloves when handling the battery.

Spilled fuel on a hot engine can ignite, causing damage to equipment and possible personal injury. Allow engine to cool before draining fuel from unit.

1. Disconnect applicator module battery.
   a. Unclip negative terminal protective cover.
   b. Remove negative terminal connector from battery.

REMOVAL - CONTINUED

2. Disconnect lines from burner fuel pump by performing the following steps:
   a. Loosen three screws (Figure 1, Item 1) on blower cover and remove cover (Figure 1, Item 2).
   b. Disconnect fuel pump electrical connector (Figure 2, Item 1).
   c. Place drain pan under fuel pump (Figure 2, Item 2) to catch residual fuel.
   d. Tag both fuel hoses (Figure 2, Item 3); left is supply and right is return.
   e. Loosen and remove two fuel hoses (Figure 2, Item 3) at fuel pump (Figure 2, Item 2).
   f. Loosen and slide back fuel line retaining nut (Figure 2, Item 4) at fuel pump (Figure 2, Item 2). Disconnect burner nozzle fuel supply line (Figure 2, Item 5).

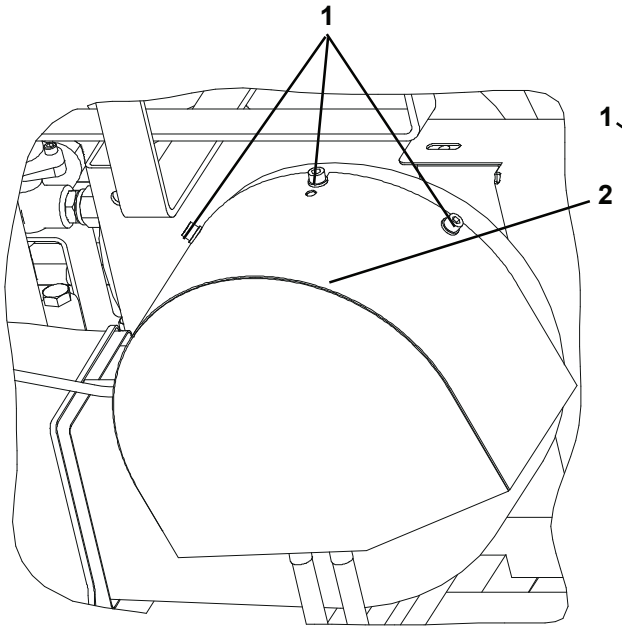


Figure 1. Blower Cover.

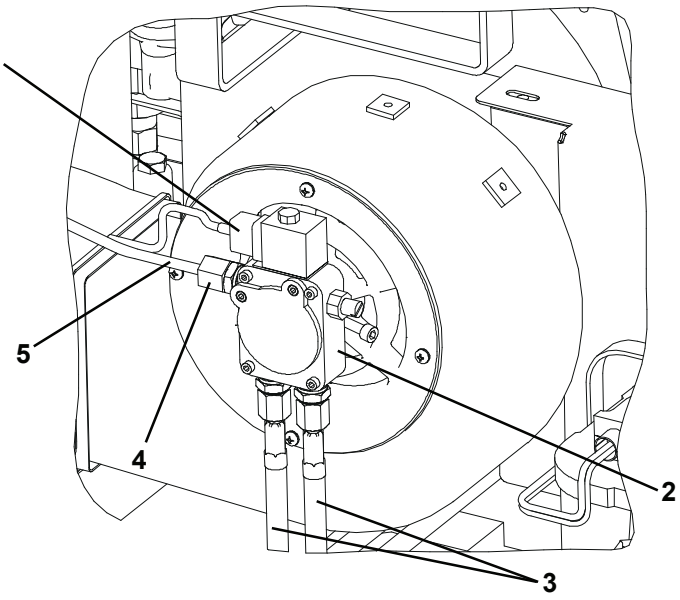


Figure 2. Burner Fuel Pump

REMOVAL - CONTINUED

3. Cut and remove cloth collar cable ties (Figure 3, Item 1) and remove cloth collar (Figure 3, Item 2) from blower unit.

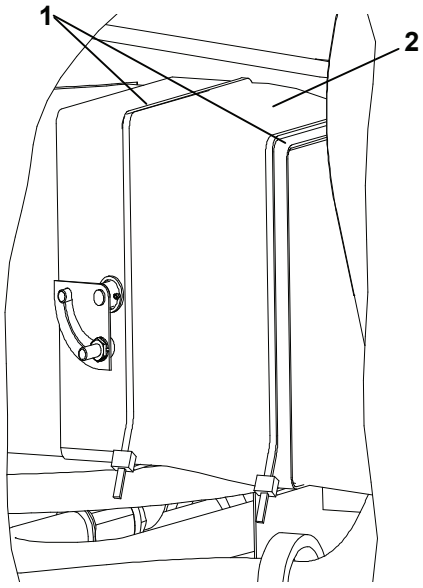


Figure 3. Burner Unit Collar Assembly - Removal.

4. Loosen but do not remove hex nut from side of V-belt protective cover.
5. Loosen but do not remove screw and washer from top of V-belt protective cover.
6. Remove two nuts and washers (Figure 4, Item 1) retaining blower V-belt cover (Figure 4, Item 2) and remove V-belt cover.

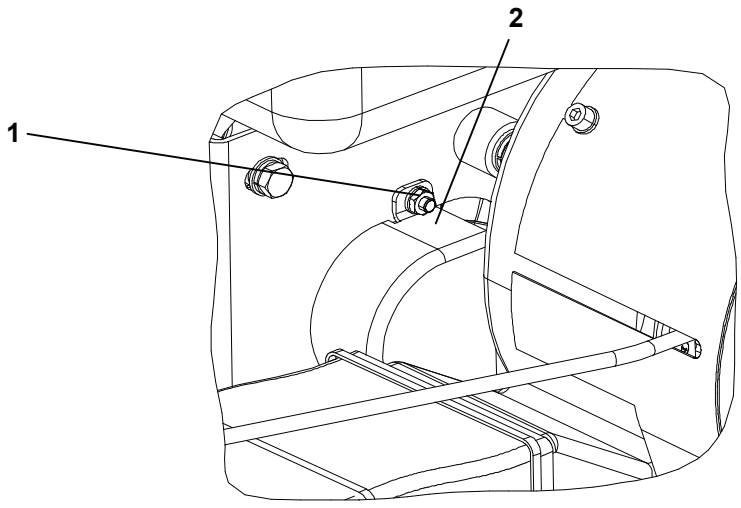


Figure 4. Blower V-Belt Cover Assembly.

REMOVAL - CONTINUED

7. Loosen three mounting bolts and spacers (Figure 5, Item 1) securing blower mounting plate (Figure 5, Item 2) to engine.
8. Slide blower mounting plate assembly (Figure 5, Item 2) to left and remove small V-belt from engine pulley.
9. Loosen and remove three blower retaining nuts and washers (Figure 5, Item 3) and remove blower assembly.
10. Remove hex head bolt and washer that retains pulley to blower unit. Remove pulley.

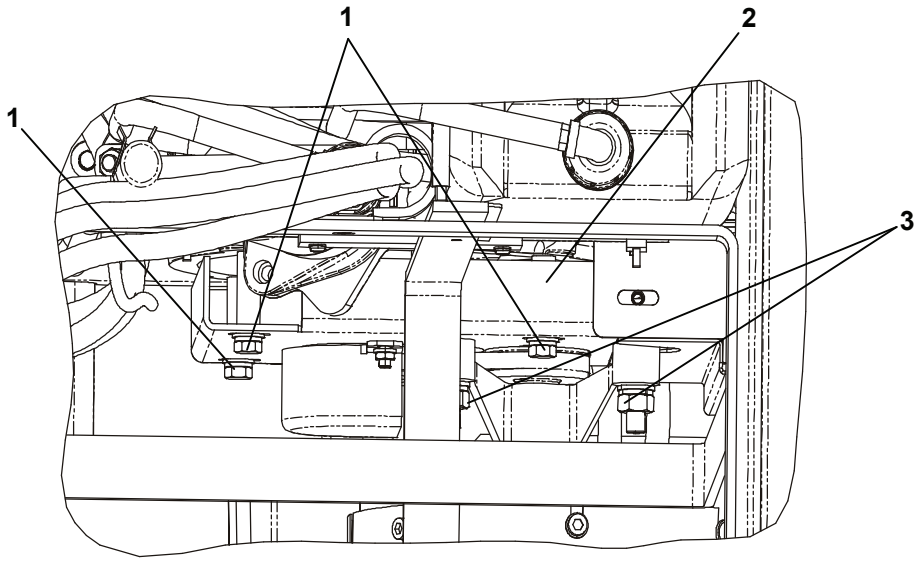


Figure 5. Blower Mounting Plate Assembly – Top View.

END OF TASK

INSTALLATION

1. Install blower pulley onto blower assembly.
2. Install hex-head screw and washer securing blower pulley to blower assembly. Tighten hex-head screw.
3. Install V-belt onto blower pulley.
4. Align blower assembly to three mounting studs (Figure 5, Item 3) on the blower mounting plate (Figure 5, Item 2). Install blower assembly and secure with three washer and nuts. Tighten nuts.
5. Install V-belt onto engine pulley.
6. Slide blower mounting plate (Figure 5, Item 2) right to tension blower V-belt. The blower belt tension should be 1/8 to 1/4 of an inch pressed down in center of V-belt. Adjust belt tension if required.
7. Tighten three mounting bolts (Figure 5, Item 1).

INSTALLATION - CONTINUED

8. Tighten hex head nut on side of V-belt protective cover.
9. Tighten screw and washer on top of V-belt protective cover.
10. Install blower belt cover (Figure 4, Item 2) and secure cover with two nuts and washers (Figure 4, Item 1). Tighten nuts.
11. Install cloth collar (Figure 6, Item 2) evenly between blower unit duct (Figure 6, Item 3) and flow heater duct (Figure 6, Item 4).
12. Secure cloth collar (Figure 6, Item 2) with two cable ties (Figure 6, Item 1).

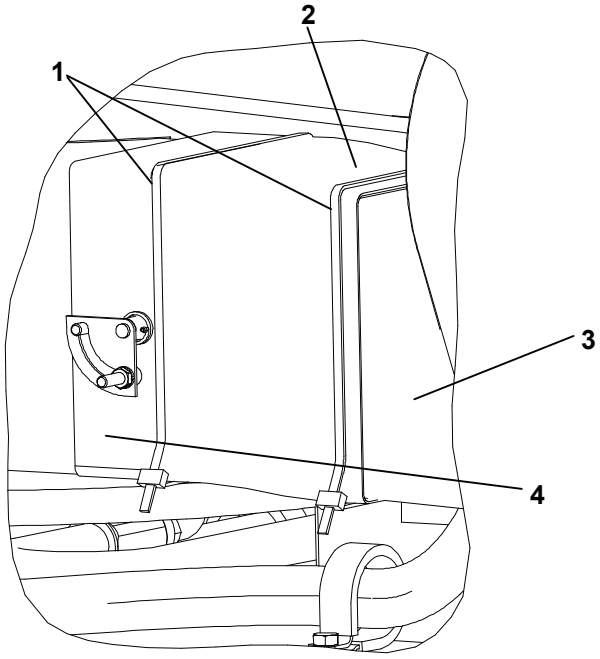


Figure 6. Burner Unit Collar Assembly – Installation.

INSTALLATION - CONTINUED

13. Install two fuel hoses (Figure 7, Item 4) to fuel pump, left is supply and right is return. Remove marking tags.

14. Install burner nozzle fuel line (Figure 7, Item 1):

    a. Screw on union nut (Figure 7, Item 2) at fuel pump.

    b. Tighten union nut (Figure 7, Item 2) securely.

15. Connect fuel pump electrical connector to fuel pump (Figure 7, Item 3).

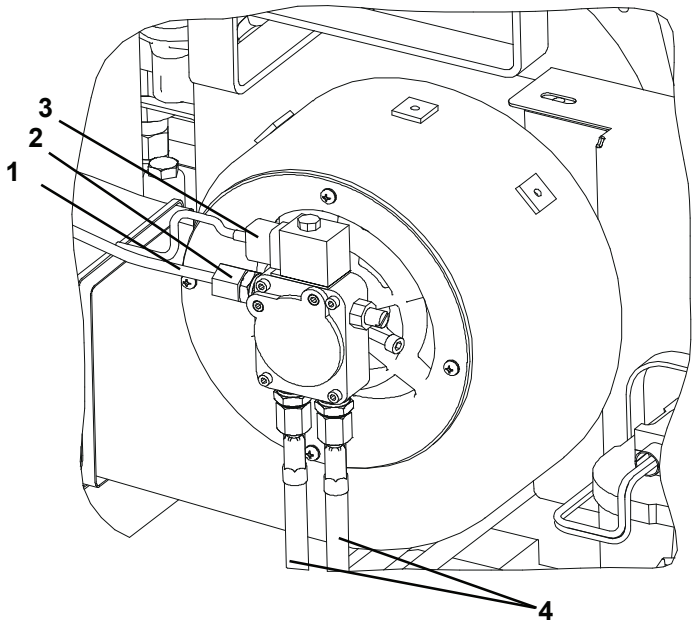


Figure 7. Burner Pump Retaining Screw and Connections.

16. Connect applicator module battery.

    a. Attach negative terminal connector.

    b. Close terminal protective cover.

17. Operate applicator module using warm or hot water mode (Operator's Manual, WP 0008) and check for fuel leaks at fuel pump connections.

18. Shut down equipment (Operator's Manual, WP 0013).

19. Install blower cover (Figure 1, Item 2) and secure with three screws (Figure 1, Item 1)

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
BURNER UNIT CLOTH COLLAR REPLACEMENT

INITIAL SETUP:

Test Equipment
Not Applicable

Tools
Tool Kit, General Mechanic (WP 0082, Item 2)

Materials/Parts
Boot, Dust and Moisture (WP 0070, Item 9)
Strap, Tiedown electrical (2) (WP 0070, Item 10)

Personnel Required
Equipment Repairer/Mechanic

References
Not Applicable

Equipment Condition
Engine off

REMOVAL

1. Cut and remove both cable ties (Figure 1, Item 3).
2. Remove burner unit cloth collar (Figure 1, Item 4) by carefully sliding hole (Figure 1, Item 2) in collar over damper spring bracket (Figure 1, Item 1).
3. Discard defective burner unit cloth collar (Figure 1, Item 4) and both cable ties (Figure 1, Item 3).

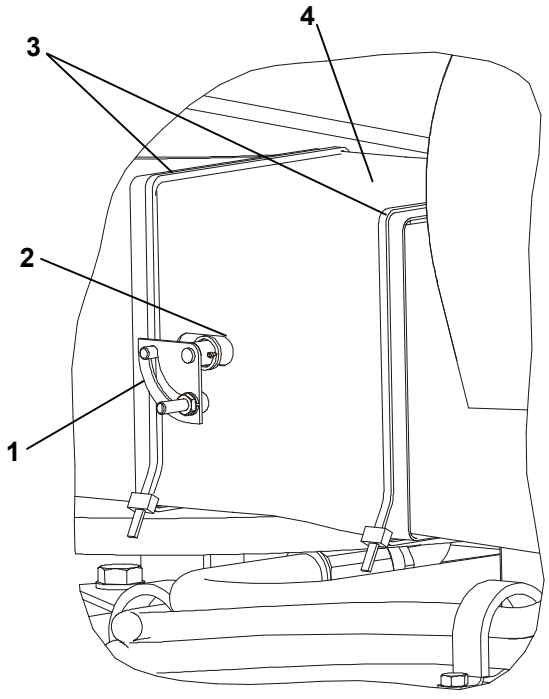


Figure 1. Burner Unit Collar Assembly – Removal.

END OF TASK

INSTALLATION

1. Install burner unit cloth collar (Figure 2, Item 2) evenly between blower unit duct (Figure 2, Item 3) and flow heater duct (Figure 2, Item 4).

2. Secure cloth collar with two cable ties (Figure 2, Item 1).

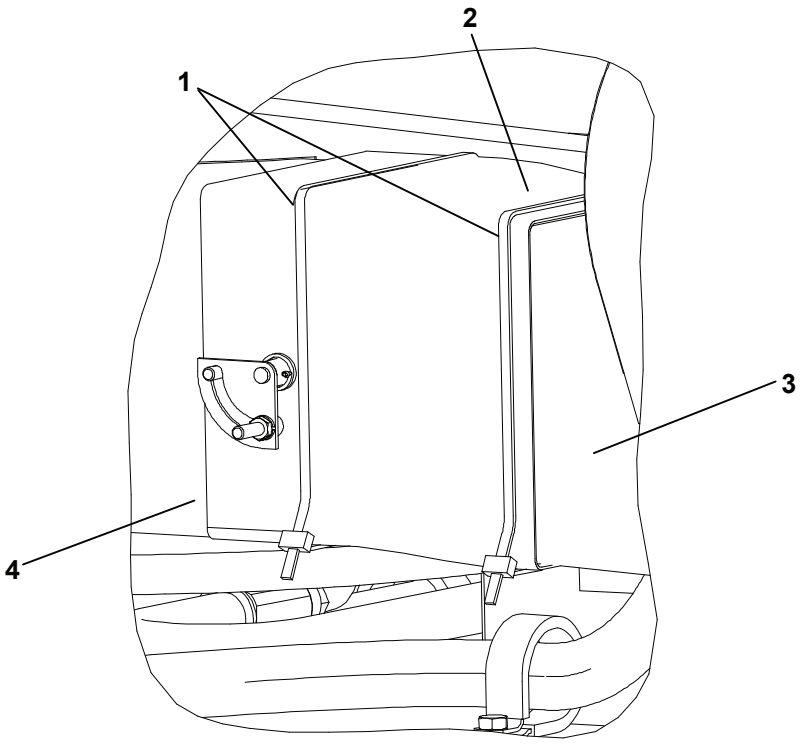


Figure 2. Burner Unit Collar Assembly - Installation.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
BURNER FUEL PUMP AND FUEL PUMP COUPLING REPLACEMENT AND FUEL HOSE REPLACEMENT

INITIAL SETUP:

Test Equipment
Not Applicable

Tools
Tool Kit, General Mechanic (WP 0082, Item 2)

Materials/Parts
Pump, Rotary (WP 0070, Item 15)
Kupplung (WP 0070, Item 5)
Sleeve, Clinch Tube (2) (WP 0073, Item 6)
Adapter, Straight Tube (WP 0073, Item 10)
Hose Assembly (2) (WP 0073, Item 5)
Pan, Drain (WP 0083, Item 8)
Tape, Teflon (WP 0083, Item 14)
Tags, Marking (WP 0083, Item 12)
Cloth, Cleaning (WP 0083, Item 3)

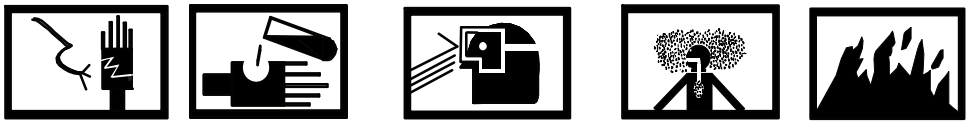
Personnel Required
Equipment Repairer/Mechanic

References
TM 3-4230-238-10

Equipment Condition
Applicator module set on level ground
Engine off and cool

BURNER FUEL PUMP AND FUEL PUMP COUPLING REMOVAL

WARNING



ELECTRICAL CHEMICAL EYE PROTECTION VAPOR FIRE

Always disconnect battery cables before performing maintenance to prevent electrical shock which could cause injury or death. Always wear eye protection and protective gloves when handling the battery.

Spilled fuel on a hot engine can ignite, causing damage to equipment and possible personal injury. Allow engine to cool before draining fuel from unit.

2. Disconnect applicator module battery.
   a. Unclip negative terminal protective cover.
   c. Remove negative terminal connector from battery.

BURNER FUEL PUMP AND FUEL PUMP COUPLING REMOVAL - CONTINUED

2. Loosen three screws (Figure 1, Item 1) on blower cover and remove cover (Figure 1, Item 2).
3. Disconnect fuel pump electrical connector (Figure 2, Item 1).
4. Place drain pan under fuel pump to catch residual fuel.
5. Tag both fuel hoses (Figure 2, Item 6); left is supply and right is return.
6. Loosen and remove two fuel hoses (Figure 2, Item 6) at fuel pump (Figure 2, Item 5).
7. Loosen and slide back fuel line retaining nut (Figure 2, Item 7) at fuel pump (Figure 2, Item 5). Disconnect burner nozzle fuel supply line (Figure 2, Item 8).
8. Loosen screw (Figure 2, Item 3). Remove burner fuel pump by pulling straight out away from blower unit (Figure 2, Item 2).
9. Remove fuel pump couplings; joint coupling (Figure 3, Item 1) and pump coupling (Figure 3 Item 2). They may or may not come out with fuel pump when removed from blower housing. Inspect couplings for damage or cracks. Replace couplings if damaged or cracked. Set couplings aside for installation of new pump.

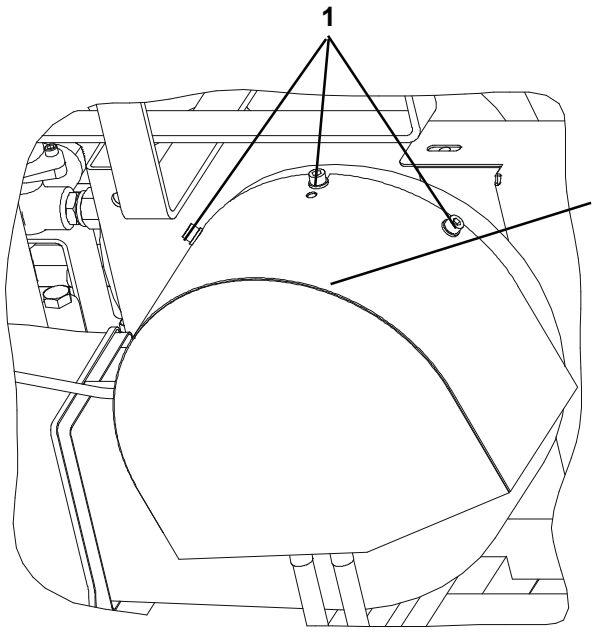


Figure 1. Blower Cover.

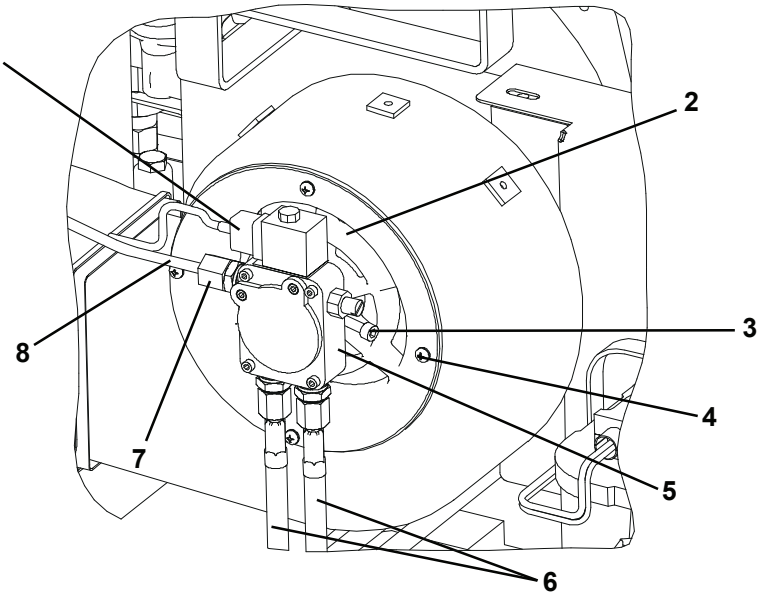


Figure 2. Burner Fuel Pump.

BURNER FUEL PUMP AND FUEL PUMP COUPLING REMOVAL - CONTINUED

10. Ensure blower coupling (Figure 4, Item 1) is in place.
    a. If not, remove four screws (Figure 2, Item 4) and remove blower unit mount for burner fuel pump.
    b. Remount blower coupling and blower unit mount. Install and tighten four screws.
11. Drain residual fuel from fuel pump into drain pan.

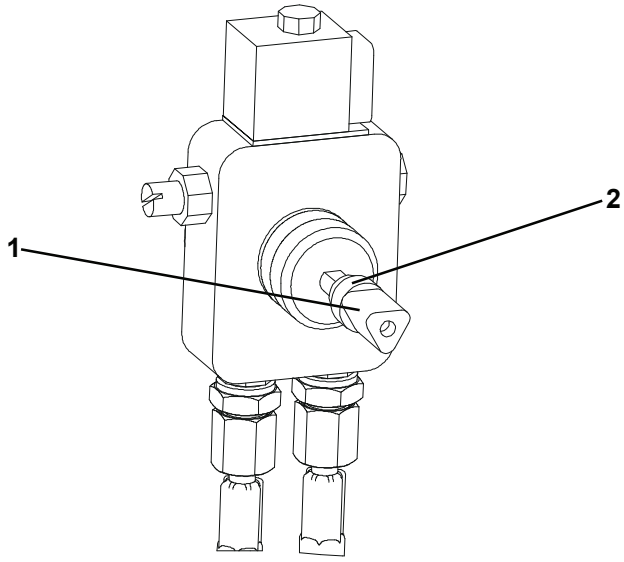


Figure 3. Fuel Pump Couplings.

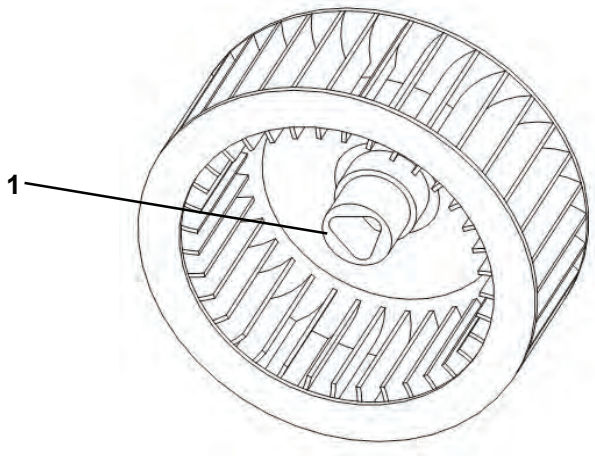


Figure 4. Blower Coupling.

END OF TASK

INSTALLATION OF BURNER FUEL PUMP AND FUEL PUMP COUPLING

1. Apply thread sealant (e.g., Teflon tape) to threads of new fuel line clinch sleeves (Figure 5, Items 3 and 4).
2. Install one clinch sleeve on inlet of new fuel pump (Figure 5, Item 3) and one on outlet of new fuel pump (Figure 5, Item 4).
3. Install new burner nozzle fuel line adapter (Figure 5, Item 2) onto new fuel pump (Figure 5, Item 1).
4. Align fuel pump drive coupling (Figure 6, Item 1) to fuel pump hex shaft and push onto shaft (Figure 5, Item 5).
    a. Align fuel pump coupling (Figure 6, Item 2) to blower coupling (Figure 4, Item 1) and insert fuel pump into blower housing.

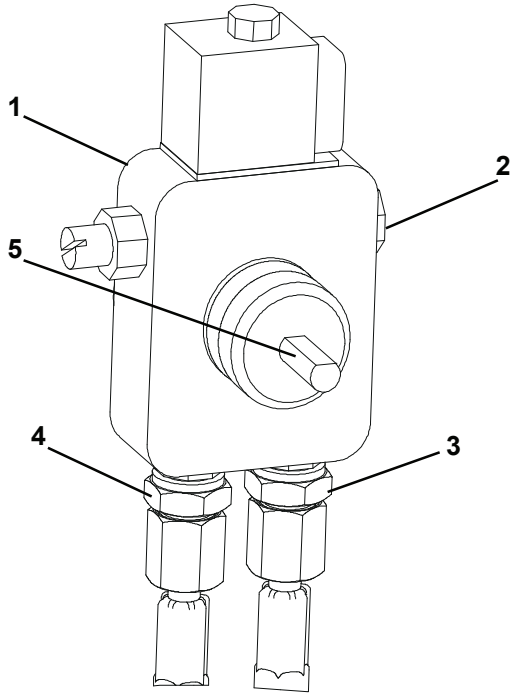


Figure 5. Burner Fuel Pump Shaft.

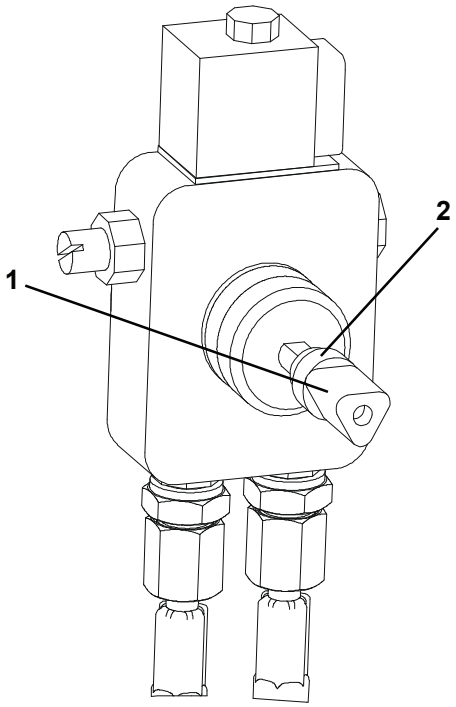


Figure 6. Fuel Pump Couplings.

INSTALLATION OF BURNER FUEL PUMP AND FUEL PUMP COUPLING - CONTINUED

b. Ensure couplings are aligned so that coupling lugs fit into each other's recessed pockets.

c. Ensure retaining groove on fuel pump is located far enough inward that fuel pump retaining screw (Figure 7, Item 1) will firmly secure fuel pump to blower housing.

d. Tighten retaining screw.

5. Install two fuel hoses (Figure 7, Item 2) to fuel pump, left is supply and right is return. Remove tags.

6. Install burner nozzle fuel line.

a. Screw on retaining nut (Figure 7, Item 3) at fuel pump.

b. Tighten retaining nut (Figure 7, Item 3) securely.

7. Connect fuel pump electrical connector to fuel pump (Figure 7, Item 4).

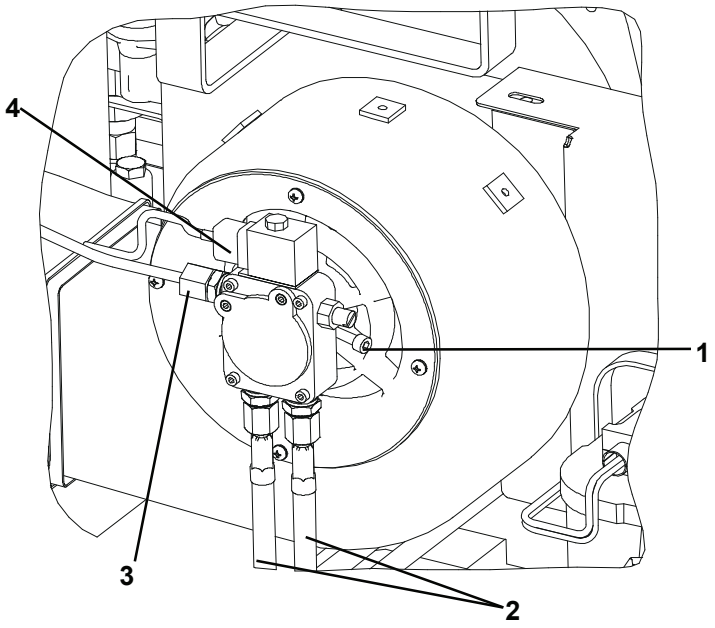


Figure 7. Burner Pump Retaining Screw and Connections.

8. Connect applicator module battery.

a. Attach negative terminal connector.

b. Close terminal protective cover.

9. Operate applicator module using warm or hot water mode (Operator's Manual, WP 0008) and check for fuel leaks at fuel pump connections.

10. Shut down equipment (Operator's Manual, WP 0013).

INSTALLATION OF BURNER FUEL PUMP AND FUEL PUMP COUPLING - CONTINUED

11. Install blower cover (Figure 8, Item 2) on blower. Tighten three screws (Figure 8, Item 1).

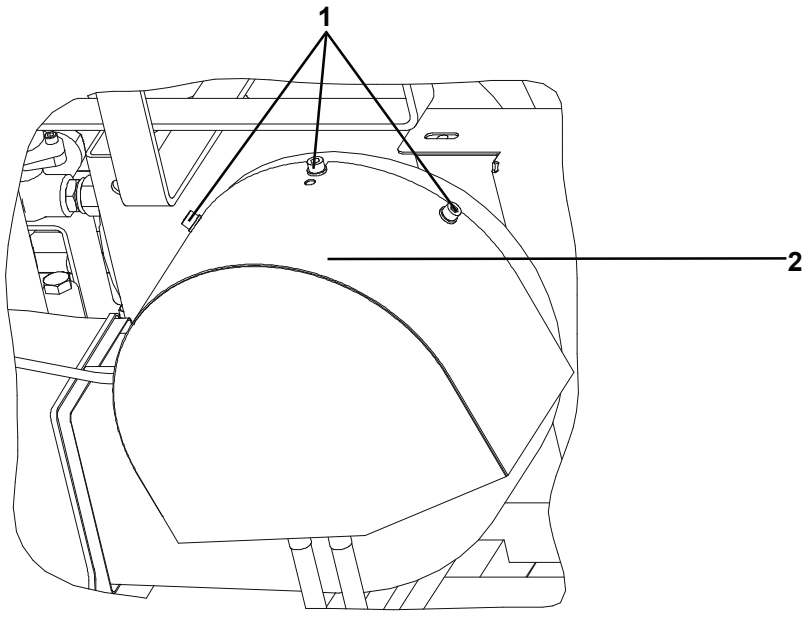


Figure 8. Blower Cover.

END OF TASK

FUEL HOSE REMOVAL

1. Disconnect applicator module battery.
    a. Unclip negative terminal protective cover.
    b. Remove negative terminal connector from battery.
2. Loosen three screws (Figure 8, Item 1) on blower cover and remove cover (Figure 8, Item 2).
3. Place drain pan under fuel pump to catch residual fuel.

FUEL HOSE REMOVAL-CONTINUED

4. Locate and disconnect defective fuel hose (Figure 9, Item 2) at fuel pump (Figure 9, Item 1).

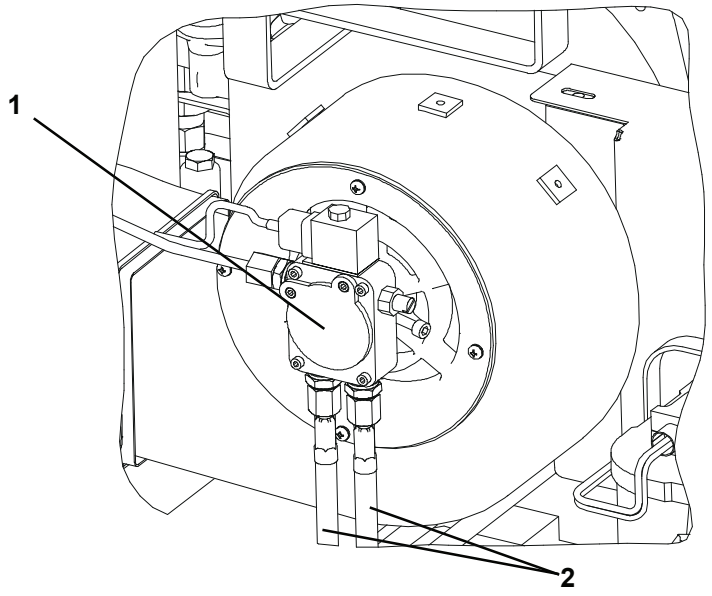


Figure 9. Fuel Supply Hose.

5. Locate and remove defective fuel hose (Figure 10, Item 1) at fuel block (Figure 10, Item 2). Discard fuel hose.

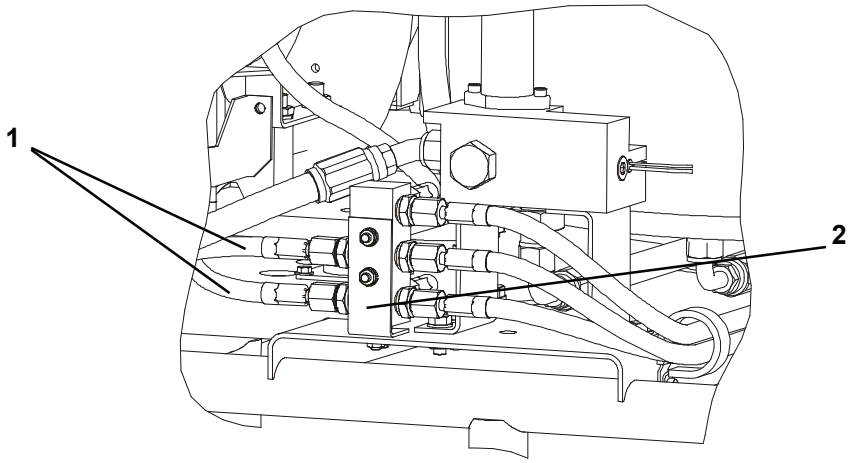


Figure 10. Fuel Block.

END OF TASK

FUEL HOSE INSTALLATION

1. Connect burner fuel pump hose (Figure 10, Item 1) to fuel block (Figure 10, Item 2). Do not tighten hose.

2. Slide burner fuel pump hose under engine mounting plate to position hose for connection to blower fuel pump.

3. Connect and tighten burner fuel pump hose (Figure 9, Item 2) to burner fuel pump (Figure 9, Item 1).

4. Check that fuel hose is not kinked or twisted. Straighten out kinked or twisted hose. Tighten fuel hose at fuel block.

5. Connect applicator module battery.

   a. Attach negative terminal connector.

   b. Close terminal protective cover.

6. Operate applicator module using warm or hot water mode (Operator's Manual, WP 0008) and check for fuel leaks at burner fuel pump and fuel block connections.

7. Shut down applicator module (Operator's Manual, WP0013).

8. Install blower cover (Figure 8, Item 2) on blower. Tighten three screws (Figure 8, Item 1).

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
BLOWER UNIT DAMPER SPRING REPLACEMENT

INITIAL SETUP:

Test Equipment
Not Applicable

Personnel Required
Equipment Repairer/Mechanic

Tools
Tool Kit, General Mechanic (WP 0082, Item 2)
Bit, star-head (WP 0082, Item 3)

References
Not Applicable

Materials/Parts
Spring, Helical Torsion (WP 0074, Item 6)
Boot, Dust and Moisture (WP 0070, Item 9)
Strap, Tiedown electrical (2) (WP 0070, Item 10)
Cloth, Cleaning (WP 0083, Item 3)
Accessory Kit (WP 0082, Item 1)

Equipment Condition
Applicator module set on level ground
Engine off and cool

REMOVAL

WARNING

ELECTRICAL **CHEMICAL** **EYE PROTECTION**

Always disconnect battery cables before performing maintenance to prevent electrical shock which could cause injury or death. Always wear eye protection and protective gloves when handling the battery.

1. Disconnect applicator module battery.
   a. Unclip negative terminal protective cover.
   b. Remove negative terminal connector from battery.

REMOVAL - CONTINUED

2. Remove two cable ties (Figure 1, Item 1) that secure collar (Figure 1, Item 2) to burner unit and blower assembly. Discard if damaged.
3. Slide cloth collar from blower assembly and burner unit, put to the side.
    a. Inspect cloth collar for any rips or tears.
    b. Replace cloth collar if necessary.

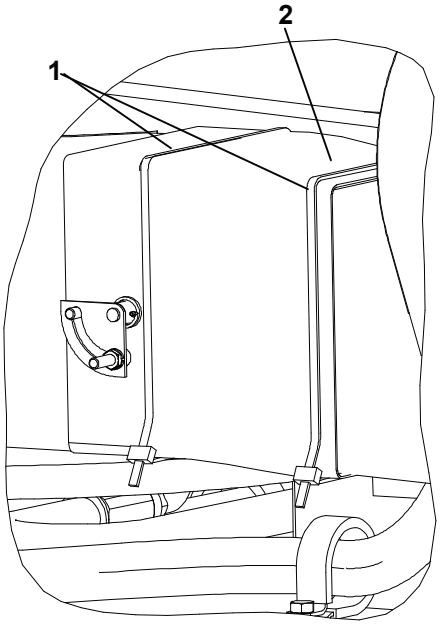


Figure 1. Cloth Collar Assembly.

REMOVAL - CONTINUED

4. Remove damper as follows:
   a. Locate damper inside burner unit; loosen and remove two screws (Figure 2, Item 1).
   b. Remove damper (Figure 3, Item 2) and set aside, away from possible damage.
5. Observe and note the correct positioning of the spacers on the damper shaft prior to removal of damper shaft.
6. Slide damper shaft outward. Spring (Figure 3, Item 3) may or may not come out on its own as shaft is removed. If not, remove spring manually.

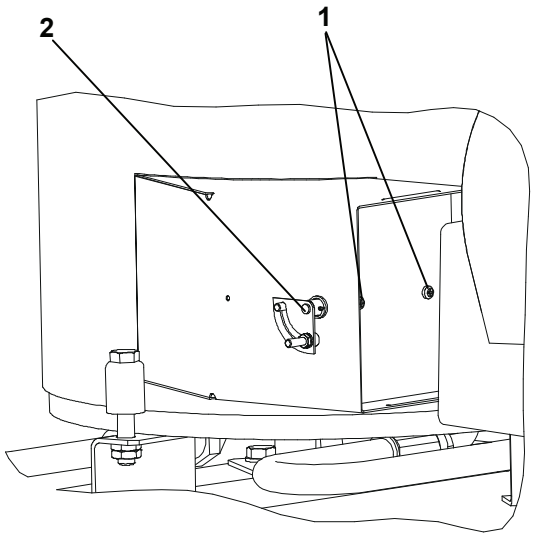


Figure 2. Damper – Closed.

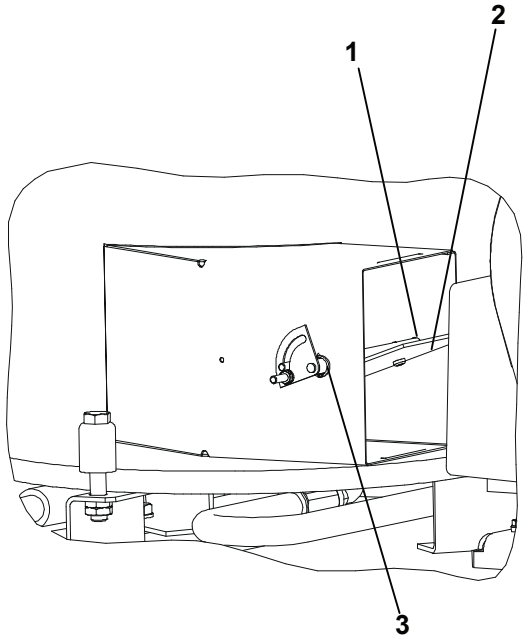


Figure 3. Damper – Open.

END OF TASK

INSTALLATION

1. Install new damper spring (Figure 4, Item 1) so that looped end is inserted into cotter pin loop on damper shaft.

2. Insert damper shaft into burner unit far enough to install correct number of spacers (Figure 5, Item 1) for outward mounting (inside of burner unit) area and for the inside area as well.

   a. Ensure that correct spacers are properly located.

   b. Finish inserting damper shaft (Figure 4, Item 3) until it aligns with inside hole of burner unit.

3. Check spacers for alignment against each inside surface against burner unit.

4. Install damper (Figure 4, Item 2) assembly to damper shaft (Figure 4, Item 3).

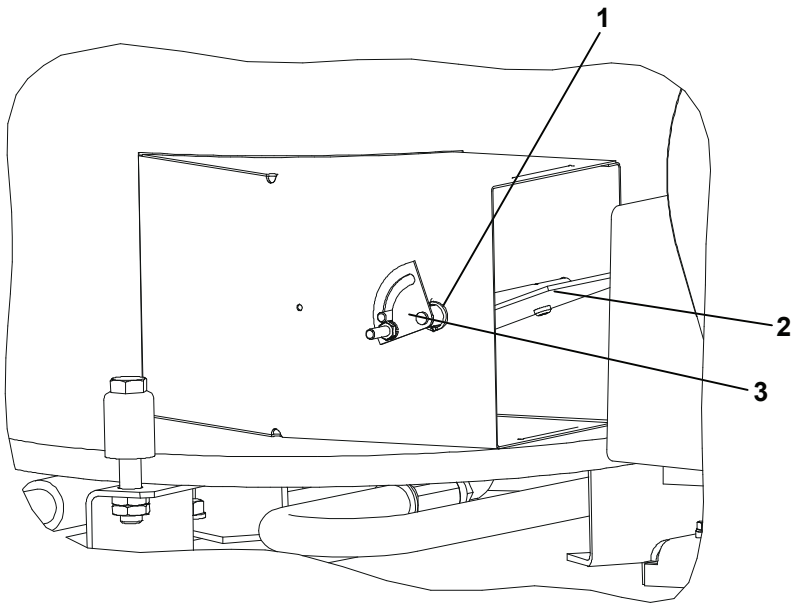


Figure 4. Damper Switch.

INSTALLATION - CONTINUED

5. Secure damper to damper shaft with two screws (Figure 6, Item 1).

6. Insert loose end of damper spring (Figure 5, Item 2) into hole located on burner unit housing. Ensure that damper spring is wound so that damper is being forced clockwise to open position. There is spring tension if moving counterclockwise.

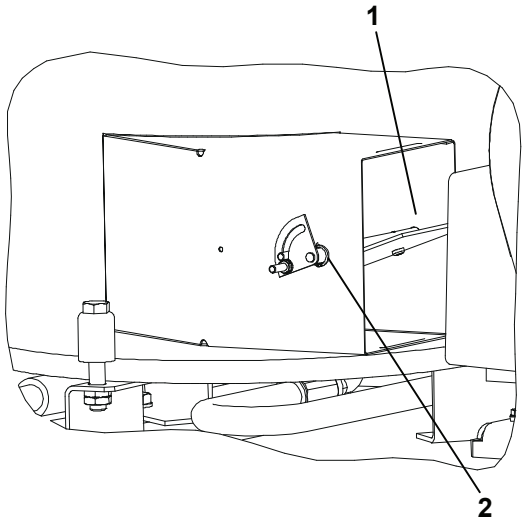


Figure 5. Damper – Open.

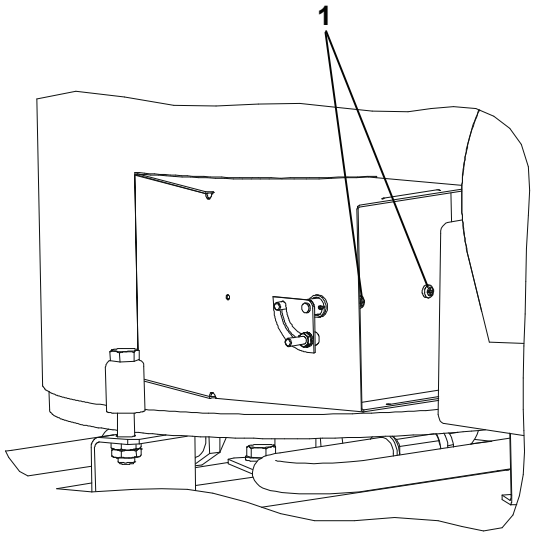


Figure 6. Damper – Closed.

INSTALLATION - CONTINUED

7. Install cloth collar (Figure 7, Item 2) onto burner unit and blower housing.
8. Secure cloth collar (Figure 7, Item 2) with two cable ties (Figure 7, Item 1).
9. Connect applicator module battery.
    a. Attach negative connector.
    b. Close terminal protective cover.

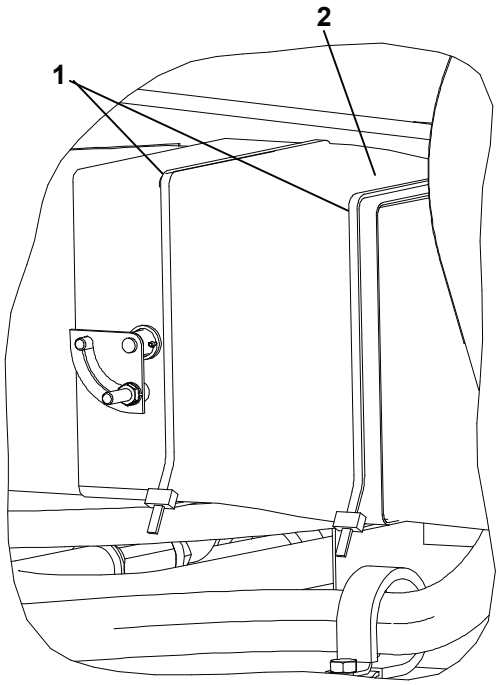


Figure 7. Cloth Collar Assembly.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
BATTERY SERVICE, TESTING, CABLE/WIRING, AND TERMINAL CONNECTOR REPLACEMENT

INITIAL SETUP:

Test Equipment
Volt/Ohm Meter (WP 0082, Item 3)

Tools
Tool Kit, General Mechanic (WP 0082, Item 2)
Battery Kit, Service, (WP 0082, Item 3)

Materials/Parts
Battery, Storage (WP 0071, Item 50)
Terminal Lug, Negative (WP0071, Item 52)
Terminal Lug, Positive (WP0071, Item 51)
Shield, Battery Post Negative (WP 0071, Item 54)
Shield, Battery Post Positive (WP 0071, Item 53)
Wire, Electrical (WP 0071, Items 55, 57 & 59)
Wire, Electrical (WP 0071, Item 61)
Terminal Lug (WP0071, Items 56, 58, 60 & 62)
Strap, Tiedown electrical (WP 0083, Item 11)
Solvent, Cleaning (WP 0083, Item 10)

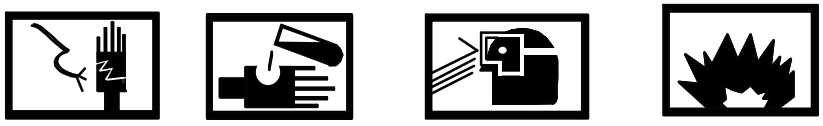
Personnel Required
Equipment Repairer/Mechanic

References
Not Applicable

Equipment Condition
Applicator module set on level ground
Engine off and cool

SERVICE

WARNING



Always disconnect battery cables before performing maintenance to prevent electrical shock which could cause injury or death. Always wear eye protection and protective gloves when handling the battery.

Do not allow smoking or the use of an open flame while servicing batteries. Batteries generate hydrogen, a highly explosive gas.

1. Inspect battery for cracks, leaks, and other damage.
2. Inspect cables for frayed insulation, broken wires, bent or broken lugs, and corroded terminal lugs.
3. Disconnect applicator module battery.
   a. Unclip terminal protective covers (Figure 1, Item 2).
   b. Remove negative terminal lug and protective cover (Figure 1, Item 3) from battery.
   c. Remove positive terminal lug and protective cover(Figure 1, Item 5) from battery.

SERVICE - CONTINUED

d. Loosen battery hold-down straps (Figure 1, Item 4) and lift battery from tray using attached handle (Figure 1, Item 1). Note position of straps in order to ensure correct reinstallation.

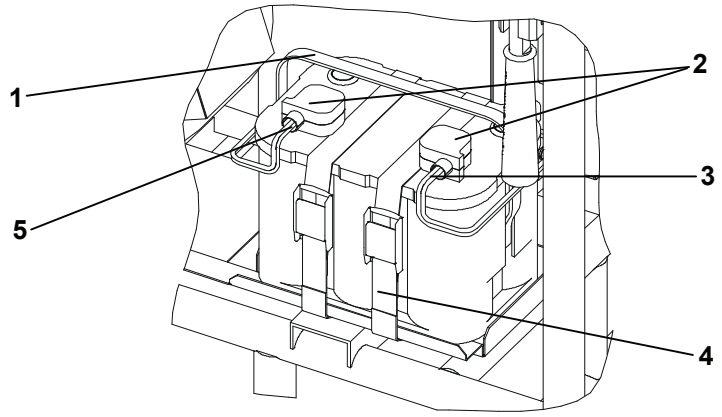


Figure 1. Battery Assembly.

4. Clean terminals and cable lugs of all corrosion and lubricate terminals and lugs with light coating of grease, type GAA, as listed in the lubrication chart. Replace battery terminal Lugs or covers (Figure 1, Items 3 and 5) if damaged

5. Remove battery from battery tray.

6. Inspect battery tray for cracks, breaks, corrosion, and other damage. Clean as required

7. Reinstall applicator module battery.

   a. Place battery into battery tray.

   b. Secure battery with hold down straps (Figure 1, Item 4). Ensure straps hold battery tightly in place.

   c. Attach positive terminal protective cover and terminal lug. Tighten terminal lug. (Figure 1, Item 5).

   d. Attach negative terminal protective cover and terminal lug. Tighten terminal lug. (Figure 1, Item 3).

   e. Close terminal protective covers (Figure 1, Item 2).

END OF TASK

TEST

NOTE

Do not start applicator module to check battery voltage.

1. Set volt/ohm meter to DC voltage scale.
2. Touch black probe to negative battery terminal and red probe to positive terminal. Voltage reading must be at least 12.5 volts.
3. If reading is less than 12.5 volts, charge battery.
4. If after charging battery, voltage reading is still less than 12.5 volts, replace battery.

END OF TASK

REMOVAL

1. Unclip terminal protective covers (Figure 2, Item 2).
2. Remove negative terminal lug (Figure 2, Item 3) and terminal protective cover (Figure 2, Item 2) from battery.
3. Remove positive terminal lug (Figure 2, Item 5) and terminal protective cover (Figure 2, Item 2) from battery.
4. Loosen battery hold-down straps (Figure 2, Item 4) and lift battery from tray using attached handle (Figure 2, Item 1). Note position of straps in order to ensure correct reinstallation.

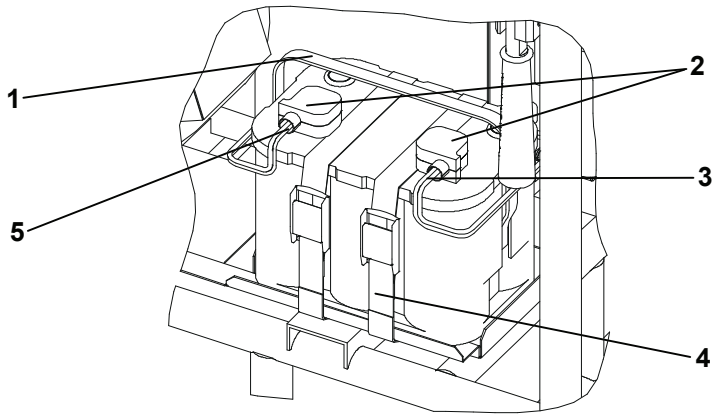


Figure 2. Battery Assembly.

END OF TASK

INSTALLATION

1. Place battery into battery tray.
2. Secure battery with hold down straps (Figure 2, Item 4). Ensure straps hold battery tightly in place.
3. Attach positive terminal protective cover (Figure 2, Item 2) and positive terminal lug (Figure 2, Item 5). Tighten terminal lug.
4. Attach negative terminal protective cover (Figure 2, Item 2) and terminal lug (Figure 2, Item 3). Tighten terminal lug.
5. Close terminal protective covers (Figure 2, Item 2).

END OF TASK

TERMINAL LUG REMOVAL

1. Disconnect applicator module battery.
   a. Unclip terminal protective covers (Figure 2, Item 2).
   b. Remove negative terminal lug and protective cover (Figure 2, Item 3) from battery.
   c. Remove positive terminal lug and protective cover(Figure 2, Item 5) from battery.
2. Remove damaged terminal lug from battery.
   a. To replace negative terminal lug: remove negative terminal lug retainer screws and retainer for negative terminal lug replacement.
   b. To replace positive terminal lug: loosen positive terminal lug retainer screws for positive terminal lug replacement.
   c. Remove battery cables from damaged terminal lug.

END OF TASK

TERMINAL LUG INSTALLATION

1. Install positive terminal lug cable connection.
   a. Loosen positive terminal lug retainer screws.
   b. Insert positive terminal lug cable connector under terminal lug retainer. Tighten screws.
2. Install negative terminal lug cable connection.
   a. Loosen and remove negative terminal lug retainer screws and retainer.
   b. Place negative terminal lug cable connections under cable retainer on top of terminal lug..
   c. Install one retaining screw through cable retainer and one cable ring terminal. Do not tighten.
   d Install remaining retaining screw through cable retainer and second cable ring terminal. Do not tighten.
   e. Align both cable connections so they are in line with terminal lug. Tighten screws.

TERMINAL LUG INSTALLATION - CONTINUED

3. Attach positive terminal protective cover (Figure 2, Item 2) and positive terminal lug (Figure 2, Item 5). Tighten terminal lug.
4. Attach negative terminal protective cover (Figure 2, Item 2) and negative terminal lug (Figure 2, Item 3). Tighten terminal lug
5. Close terminal protective covers (Figure 1, Item 2).

END OF TASK

NEGATIVE BATTERY GROUND CABLE REMOVAL

1. Disconnect applicator module battery.
   a. Unclip terminal protective covers (Figure 3, Item 2).
   b. Remove negative terminal lug (Figure 3, Item 3) and protective cover (Figure 3, Item 2) from battery.
   c. Remove positive terminal lug (Figure 3, Item 5)and protective cover (Figure 3, Item 2) from battery.

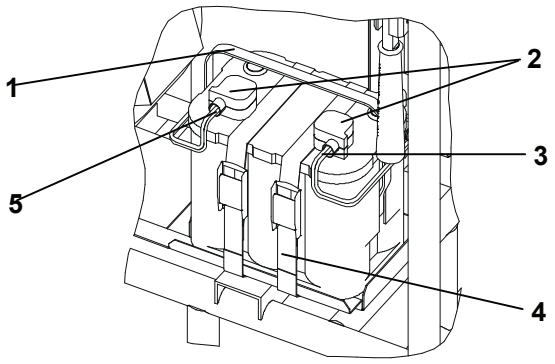


Figure 3. Battery Assembly.

2. Loosen four bolts (Figure 4, Item 1) on control panel cover (Figure 4, Item 2).
3. Remove control panel cover (Figure 4, Item 2)

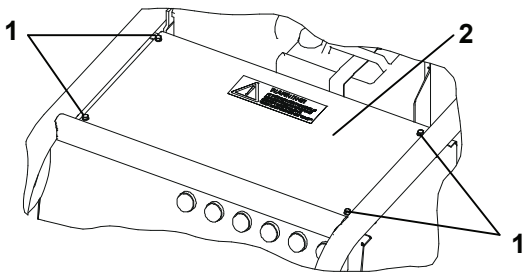


Figure 4. Control Box Assembly.

NEGATIVE BATTERY GROUND CABLE REMOVAL-CONTINUED

4. Trace negative battery cable to bottom of control box. Loosen cable retaining nut from cable retainer underneath of control box.

5. Disconnect battery cable inside of control box. Negative battery cable is secured to control box metal divider.

5. Remove screw, nut and two star washers securing ground cable to control box divider.

6. Cut ring terminal from control box end of ground cable and remove by pulling cable through bottom of control box.

7. Remove negative battery cable ground from terminal lug cable connection.
   a. Loosen two terminal lug retainer screws. Do not remove.
   b. Remove terminal lug retaining screw only on the damaged cable.
   c. Retain screw for installation of replacement cable.
   d. Retain cable for use in measurement for replacement cable.

8. Remove cable retaining nut from cable for use in installation of replacement cable.

END OF TASK

NEGATIVE BATTERY GROUND CABLE INSTALLATION

1. Measure length of old negative battery ground cable to determine replacement cable length.
   a. Cut replacement cable to appropriate length.
   b. Install cable retaining nut onto cable.
   c. With cable retaining nut facing outwards, insert end of cable into bottom of control through wire retainer. Insert at least 12 inches of cable.

2. Remove ½ inch of cable sheathing from each end of new cable.

3. Install and secure ring terminal connector on each end of cable.

4. Attach cable to grounding point on control box divider.

5. Secure cable with screw, two star washers and nut. Tighten nut.

6. Pull excess cable through bottom of control box. Leave 1/2 to 1 inch of cable on inside of control box.

7. Install cable retaining nut onto bottom of control box wire retainer. Tighten nut.

8. Attached ground cable to negative terminal lug.
   a. Insert screw through terminal lug retainer and cable ring terminal connector.
   b. Align cable connection with terminal lug and tighten screw.
   c. Tighten remaining retaining screw.

9. Install control panel cover (Figure 4, Item 2) and secure with four retaining bolts (Figure 4, Item 1).

NEGATIVE BATTERY GROUND CABLE INSTALLATION - CONTINUED

10. Connect applicator module battery.
    a. Attach positive terminal protective cover (Figure 3, Item 2) and positive terminal lug (Figure 3, Item 5). Tighten terminal lug.
    b. Attach negative terminal lug protective cover (Figure 3, Item 2) and negative terminal lug (Figure 3, Item 3) from battery Tighten terminal lug.
    c. Close terminal protective cover (Figure 3, Item 2).

END OF TASK

ENGINE GROUND CABLE REMOVAL

1. Disconnect applicator module battery.
    a. Unclip terminal protective covers (Figure 3, Item 2).
    b. Remove negative terminal lug (Figure 3, Item 3) and protective cover (Figure 3, Item 2) from battery.
    c. Remove positive terminal lug (Figure 3, Item 5) and protective cover (Figure 3, Item 2) from battery.

2. Remove cable ties (Figure 6, Item 1) securing wiring harness bundle retaining cap (Figure 5, Item 1). Remove wiring harness retaining cap from wiring harness retainer.

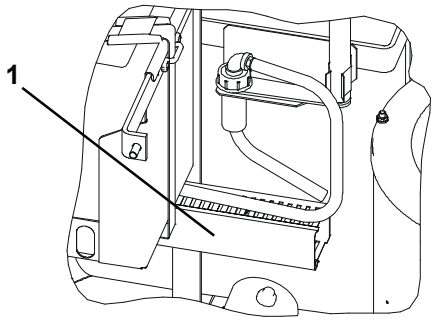


Figure 5. Wiring Harness Bundle Retaining Cap.

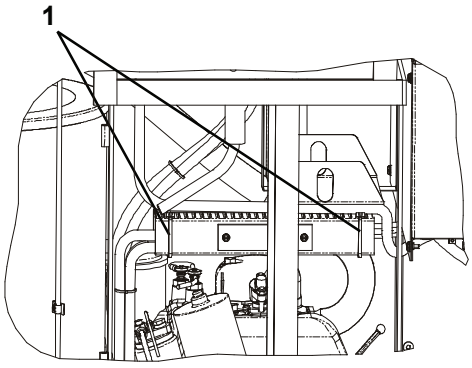


Figure 6. Wiring Harness Bundle – Reverse View.

3. Remove screw, nut and washer securing engine ground cable (Figure 7, Item 2) to mount (Figure 7, Item 1).

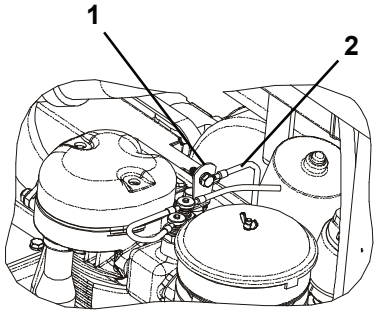


Figure 7. Engine Ground Cable - Mount.

ENGINE GROUND CABLE REMOVAL - CONTINUED

4. Separate the ground cable from the wiring harness bundle.
5. Trace negative battery cables and remove cable ties securing ground cables to each other.
6. Remove negative cable grounds from terminal lug cable connection.
   a. Loosen two terminal lug retainer screws. Do not remove.
   b. Remove terminal lug retaining screw only on the engine ground cable.
   c. Retain screw for installation of replacement cable.
   d. Retain cable for use in measurement for replacement cable.
7. Remove cable

END OF TASK

ENGINE GROUND CABLE INSTALLATION

1. Measure length of old engine ground cable to determine replacement cable length.
   a. Cut replacement cable to appropriate length.
   b. Remove ½ inch of cable sheathing from each end of new cable.
   c. Install and secure ring terminal connector on each end of cable.
2. Install replacement engine ground cable through wiring harness bundle to engine ground cable mount (Figure 7, Item 2)
3. Secure engine ground cable with screw, washers and nut at engine ground cable mount. Tighten nut.
4. Secure engine ground cable and battery ground cable together with two to three cable ties so that cables are together and do not separate.
5. Attached engine ground cable to negative terminal lug.
   a. Insert screw through terminal lug retainer and cable ring terminal connector.
   b. Align cable connection with terminal lug and tighten screw.
   c. Tighten remaining retaining screw.
6. Install wiring harness bundle into wiring harness retainer.
7. Install wiring harness bundle retaining cap. Secure cap in place with two cable ties. Cut off excess cable tie.
8. Connect applicator module battery.
   a. Attach positive terminal protective cover (Figure 3, Item 2) and positive terminal lug (Figure 3, Item 5). Tighten terminal lug.
   b. Attach negative terminal lug protective cover (Figure 3, Item 2) and negative terminal lug (Figure 3, Item 3) from battery Tighten terminal lug.
   c. Close terminal protective cover (Figure 3, Item 2).

END OF TASK

ENGINE POWER CABLE REMOVAL

1. Disconnect applicator module battery.
   a. Unclip terminal protective covers (Figure 3, Item 2).
   b. Remove negative terminal lug (Figure 3, Item 3) and protective cover (Figure 3, Item 2) from battery.
   c. Remove positive terminal lug (Figure 3, Item 5)and protective cover (Figure 3, Item 2) from battery.
2. Remove cable ties (Figure 6, Item 1) securing wiring harness bundle retaining cap Figure 5, Item 1). Remove wiring harness retaining cap from wiring harness retainer.
3. Remove nut and washer securing engine power cable (Figure 8, Item 2) to engine starter (Figure 8, Item 1). Remove power cable from starter.

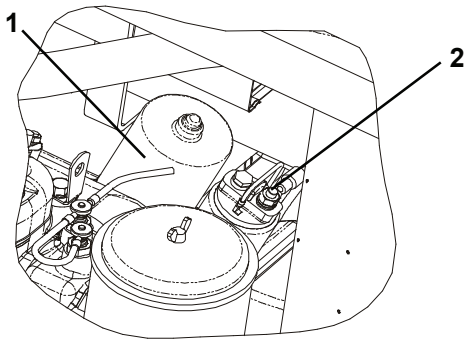


Figure 8. Engine Starter Power Cable.

4. Separate the starter power cable from the wiring harness bundle.
5. Trace starter power cable and control box power cable (red wire) and remove cable ties securing power cables to each other.
6. Remove starter power cable from positive terminal lug cable connection.
   a. Remove two terminal lug retainer screws.
   b. Remove both cables from positive terminal lug
   c. Retain screws for installation of replacement cable.
   d. Retain starter power cable for use in measurement for replacement cable.

NOTE

The power cable connection ends may have been converted to ring type terminals. If this has been accomplished, skip step 7 below.

7. Cut off wire connector that connects both power cables together at positive terminal lug.
8. Remove starter power cable

END OF TASK

ENGINE POWER CABLE INSTALLATION

1. Measure length of old engine power cable to determine replacement cable length.
    a. Cut replacement cable to appropriate length.
    b. Install starter connection protective boot onto cable.
    c. Remove 1/2 inch of cable sheathing from each end of new cable.
    d. Install and secure ring terminal connector on each end of cable. The starter terminal ring will be larger.
2. Install replacement engine power cable through wiring harness bundle to engine starter (Figure 8, Item 1).
3. Attach and secure engine power cable (Figure 8, Item 2) with nut and washers at engine starter (Figure 8, Item 1). Tighten nut.
4. Install and secure ring terminal connector on end of control box power cable (red wire).
5. Attached engine power and control box power cables to positive terminal lug.
    a. Insert screws through terminal lug retainer and cable ring terminal connectors.
    b. Align cable connections with terminal lug and tighten retaining screws.
6. Install wiring harness bundle into wiring harness retainer.
7. Install wiring harness bundle retaining cap (Figure 5, Item 1). Secure cap in place with two cable ties (Figure 6, Item 1). Cut off excess cable tie.
8. Secure engine power cable and control box cable together with two to three cable ties so that cables are together and do not separate.
9. Connect applicator module battery.
    a. Attach positive terminal protective cover (Figure 3, Item 2) and positive terminal lug (Figure 3, Item 5). Tighten terminal lug.
    b. Attach negative terminal lug protective cover (Figure 3, Item 2) and negative terminal lug (Figure 3, Item 3) from battery Tighten terminal lug.
    c. Close terminal protective cover (Figure 3, Item 2).

END OF TASK

CONTROL BOX POWER CABLE REMOVAL

1. Disconnect applicator module battery.
    a. Unclip terminal protective covers (Figure 3, Item 2).
    b. Remove negative terminal lug (Figure 3, Item 3) and protective cover (Figure 3, Item 2) from battery.
    c. Remove positive terminal lug (Figure 3, Item 5)and protective cover (Figure 3, Item 2) from battery.
2. Loosen four bolts (Figure 4, Item 1) on control panel cover (Figure 4, Item 2).
3. Remove control panel cover (Figure 4, Item 2).

CONTROL BOX POWER CABLE REMOVAL-CONTINUED

4. Trace control box power cable (Red Wire) to bottom of control box. Loosen cable retaining nut from cable retainer underneath of control box. Remove cable ties securing power cables to each other.

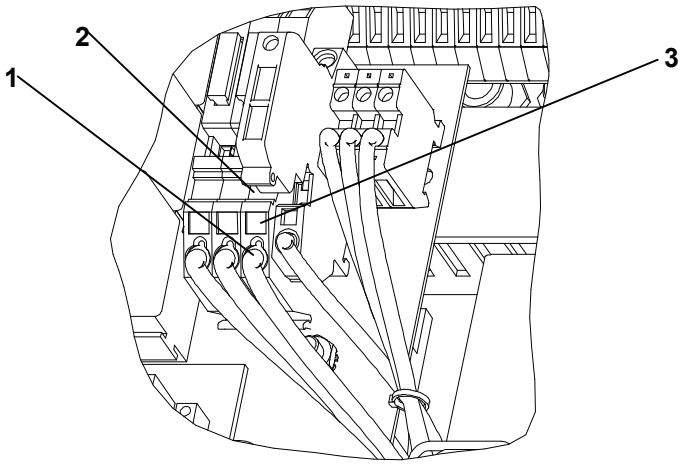


Figure 9. Control Box Power Cable Connection.

5. Disconnect control box power cable (Figure 9, Item 1) at fuse junction (Figure 9, Item 2) inside of control box.
   a. Insert small flat tip screwdriver into fuse junction wire location 1F4 (Figure 9, Item 3)
   b. Depress tab (Figure 9, Item 3) to release cable (Figure 9, Item 1).
   c. Remove power cable from fuse junction (Figure 9, Item 2).
6. Pull on power cable from underneath of control box to remove power cable from control box.
7. Remove control box power cable from positive terminal lug cable connection.
   a. Remove two terminal lug retainer screws.
   b. Remove both cables from positive terminal lug
   c. Retain screws for installation of replacement cable.
   d. Retain control box power cable for use in measurement for replacement cable.

NOTE

The power cable connection ends may have been converted to ring type terminals. If this has been accomplished, skip step 7 below.

8. Cut off wire connector that connects both power cables together at positive terminal lug.
9. Remove cable retaining nut from cable for use in installation of replacement cable.

END OF TASK

CONTROL BOX POWER CABLE INSTALLATION

1. Measure length of old control box power cable to determine replacement cable length.
    a. Cut replacement cable to appropriate length.
    b. Install cable retaining nut on new cable.
    c. Remove 1/4 to 1/2 inch of cable sheathing from each end of new cable.
    d. Install and secure a correct sized ring terminal connector on battery terminal lug end of cable. Ensure cable retaining nut open end is facing away from ring connector.
2. Install replacement control box power cable through bottom of control box into and through the cable retainer.
3. Inside of control box, route control box power cable to fuse junction wire location 1F4 (Figure 9, Item 2)
4. Connect control box power cable.
    a. Insert small flat tip screwdriver into fuse junction wire location 1F4 (Figure 9, Item 2).
    b. Depress tab (Figure 9, Item 3) to release fuse junction wire lock.
    c. Install power cable into fuse junction (Figure 9, Item 2).
    d. Remove screwdriver to release wire lock.
    e. Check wire connection by slightly pulling on wire. If wire disconnects, repeat above steps.
5. Remove excess cable from control box by carefully pulling on power cable until there is minimal excess cable.
6. Install cable retaining nut onto bottom of control box. Tighten retaining nut.
7. Secure engine power cable and control box cable together with two to three cable ties so that cables are together and do not separate.
8. Install control panel cover (Figure 4, Item 2) and secure with four retaining bolts (Figure 4, Item 1).
9. Connect applicator module battery.
    a. Attach positive terminal protective cover (Figure 3, Item 2) and positive terminal lug (Figure 3, Item 5). Tighten terminal lug.
    b. Attach negative terminal lug protective cover (Figure 3, Item 2) and negative terminal lug (Figure 3, Item 3) from battery Tighten terminal lug.
    c. Close terminal protective cover (Figure 3, Item 2).

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
CONTROL BOX REPLACEMENT

INITIAL SETUP:

Test Equipment
Not Applicable

Tools
Tool Kit, General Mechanic (WP 0082, Item 2)

Materials/Parts
Electrical Assembly (WP 0071, Item 1)
Washer, Lock (4) (WP 00071, Item 13)
Washer, Lock (3) (WP 0074, Item 5)
Gasket (2) (WP 0075, Item 57)
Accessory Kit (WP 0082,Item 1)
Pan, Drain (WP 00083, Item 8)
Oil, Engine (WP 00083, Item 6)
Strap, Tiedown electrical (WP 0083, Item 11)
Tags, Marking (WP 0083, Item 12)

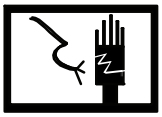
Personnel Required
Equipment Repairer/Mechanic (2)

References
TM 3-4230-238-10

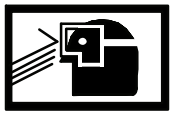
Equipment Condition
Applicator module set on level ground.
Engine off.

REMOVAL

WARNING


ELECTRICAL

CHEMICAL


EYE PROTECTION

HEAVY OBJECTS

Always disconnect battery cables before performing maintenance to prevent electrical shock which could cause injury or death.. Always wear eye protection and protective gloves when handling the battery.

When working with motor oil, avoid contact with eyes. Wear protective clothing and protective rubber gloves. Avoid prolonged or repeated inhalation of oil mist to prevent possible lung injury. If coughing or difficulty breathing develops, seek medical attention. Dispose of product in accordance with Local, State and Federal Hazardous Waste regulations.

The control box, due to size and weight, requires a two-person lift for removal and installation. Always avoid back injury by lifting with your legs.

1. Disconnect applicator module battery.
   a. Unclip terminal protective covers, if present.
   b. Remove negative terminal connector and protective cover from battery.
   c. Remove positive terminal connector and protective cover from battery.
   d. Remove cable ties from negative and positive battery cables.

REMOVAL - CONTINUED

2. Place drain pan under engine oil drain plug.
3. Remove engine oil drain plug (Figure 1, Item 1) and drain engine oil. Reinstall drain plug.

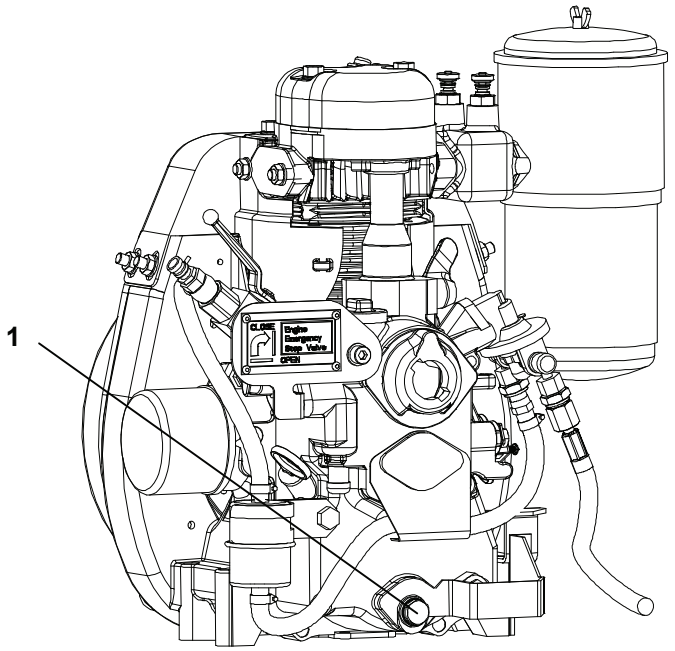


Figure 1. Engine.

4. Remove right side engine mounting bolts (Figure 2, Item 1).

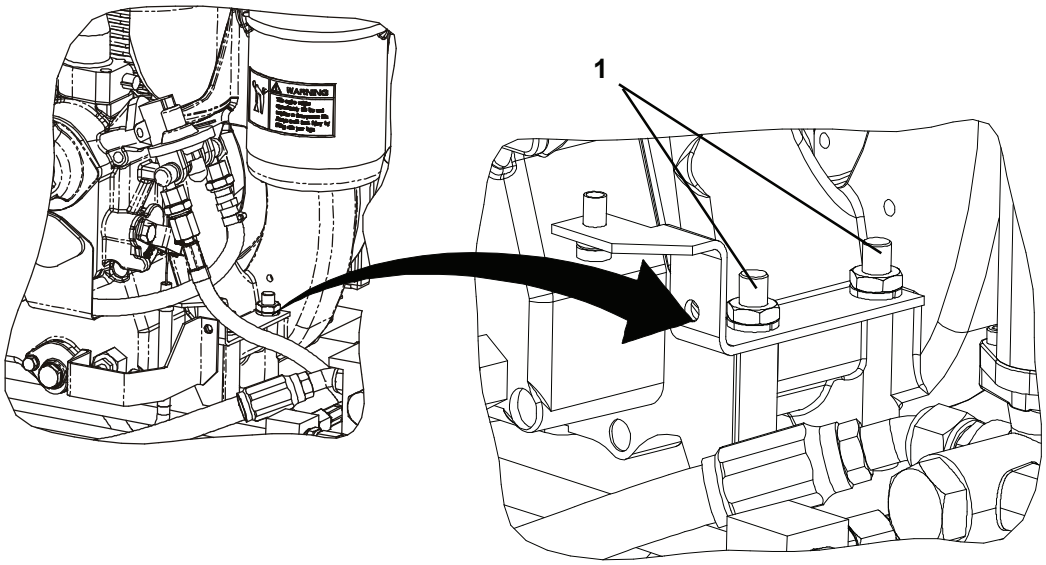


Figure 2. Engine Bolts – Right Side.

REMOVAL – CONTINUED

5. Remove throttle cable bracket mounting bolt and copper gasket (Figure 3, Item 1) from engine oil drain plug mounting plate assembly. Move bracket to right side of engine.
6. Disconnect engine oil pre-heater wire (Figure 3, Item 2).
7. Disconnect engine air intake pre-heater wire (Figure 4, Item 1).

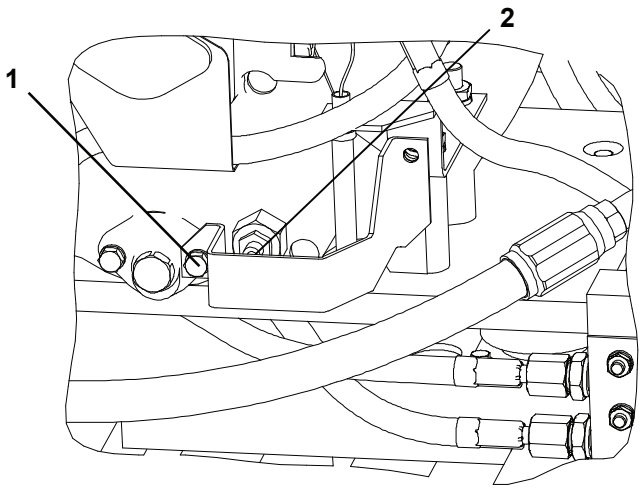


Figure 3. Drain Plug Mounting Plate Assembly.

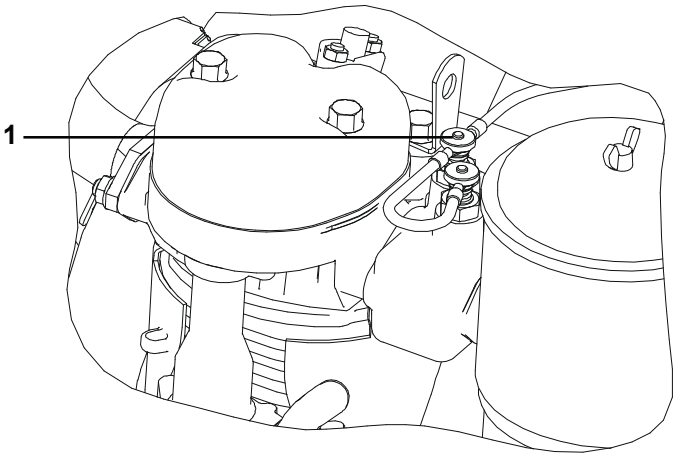


Figure 4. Engine Air Intake Pre-heater.

8. Remove wiring harness bundle retaining cap. (Figure 5, Item 1).
9. Remove all cable ties (Figure 6, Item 1) located along the wiring harness bundle, from the bottom and top of the burner assembly to the control box.

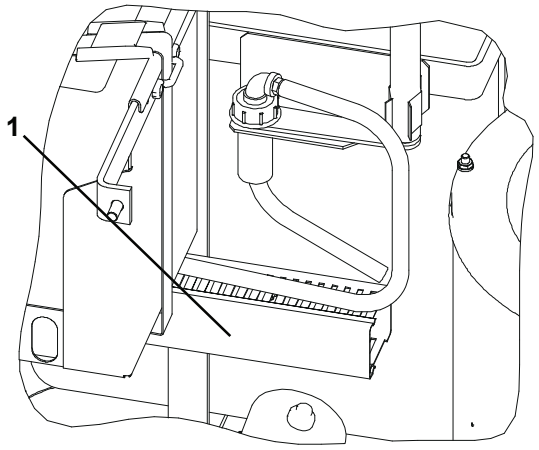


Figure 5. Wiring Harness Bundle Retaining Cap.

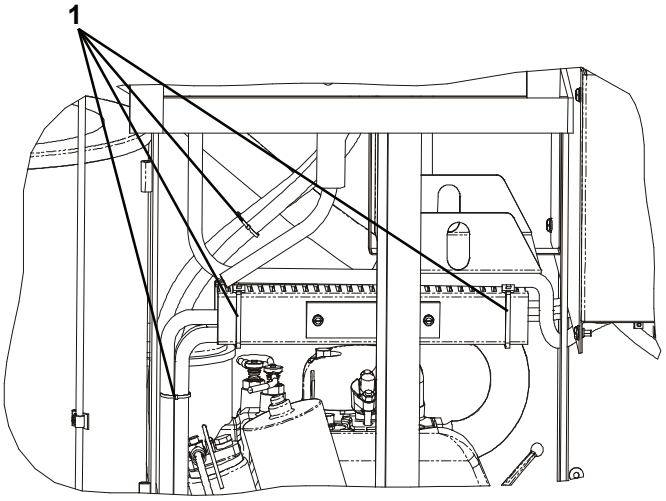


Figure 6. Wiring Harness Bundle – Reverse View.

REMOVAL – CONTINUED

NOTE

When thermostat sensor bulb assembly is removed, water may flow continuously from bottom of flow heater.

10. Loosen and remove thermostat sensor bulb assembly (Figure 7, Item 1) located at the burner high-pressure outlet (Figure 7, Item 2).

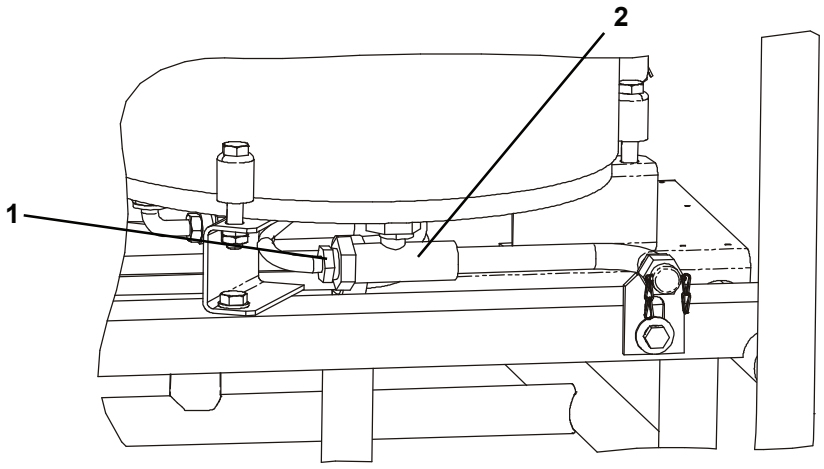


Figure 7. Thermostat Sensor/Reducer & Adapter.

11. Remove protective cover from power cable. Disconnect solenoid wire (Figure 8, Item 1), ground cable (Figure 9, Item 1), and power cable (Figure 8, Item 2) from starter.

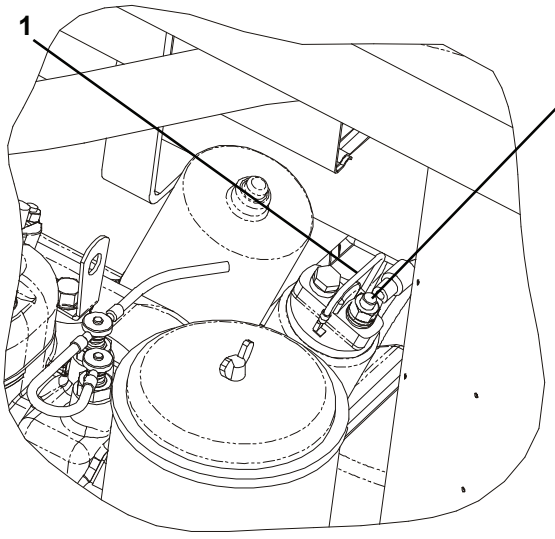


Figure 8. Starter Assembly.

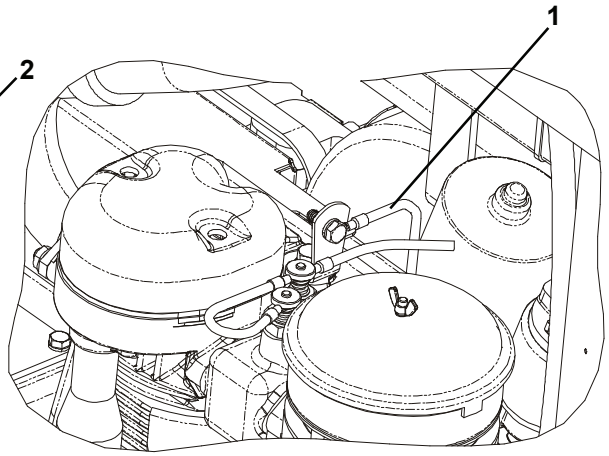


Figure 9. Starter Assembly – Ground Cable.

REMOVAL – CONTINUED

12. Remove burner top cover (Figure 10, Item 2) by removing three acorn nuts and lock-washers (Figure 10, Item 1).

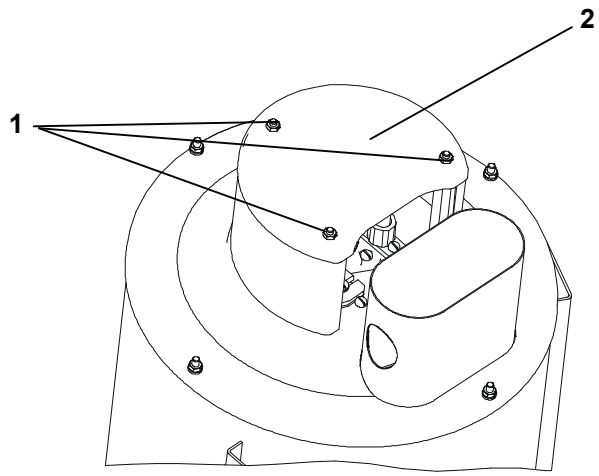


Figure 10. Burner Photo Cell Assembly.

13. Pull igniter plugs (Figure 11, Item 1) from igniter electrodes.

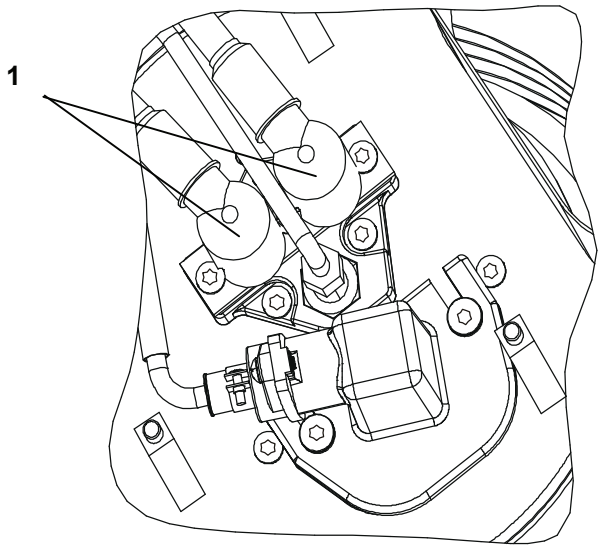


Figure 11. Igniter Holder – Igniter Plugs.

REMOVAL – CONTINUED

14. Remove photo cell (Figure 12, Item 1) by sliding out of holding device on top of burner.
15. Move photo cell wiring to control box.
16. Loosen four retaining bolts (Figure 13, Item 1) on control panel cover (Figure 13, Item 2) and remove cover.

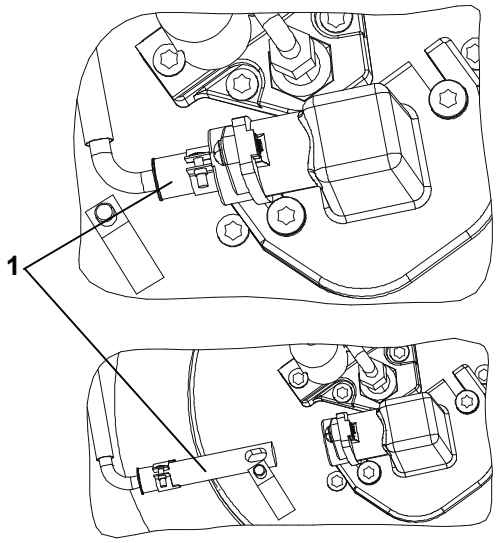


Figure 12. Burner Photo Cell Assembly Holding Device.

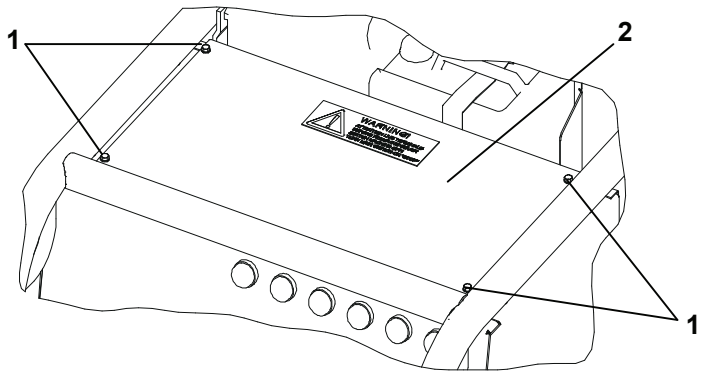


Figure 13. Control Box Assembly

17. Loosen and remove five screws and washers (Figure 14, Item 1) securing control box rear panel (Figure 14, Item 2).
18. Remove panel toward engine side.

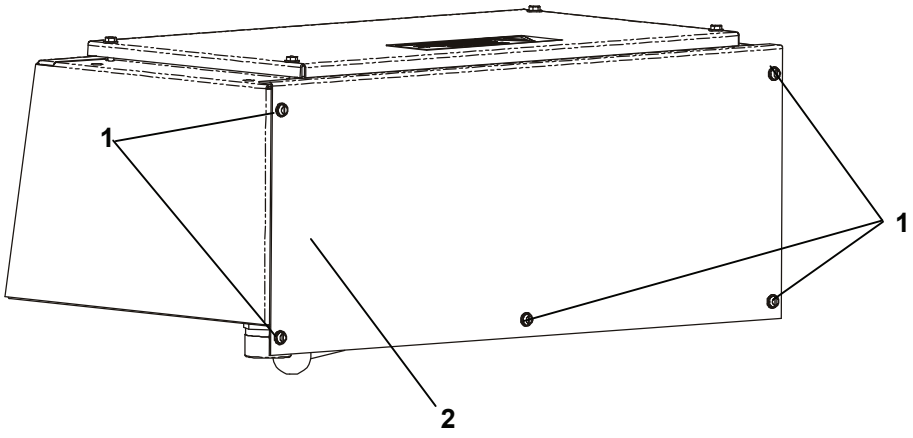


Figure 14. Control Box Assembly - Rear.

REMOVAL – CONTINUED

19. Facing rear of control box with panel removed loosen retaining nuts and disconnect the following wires from the X1 terminal (Figure 15, Item 1) listed in table below. Tag each cable on the outside bottom of control box with the name of the component.

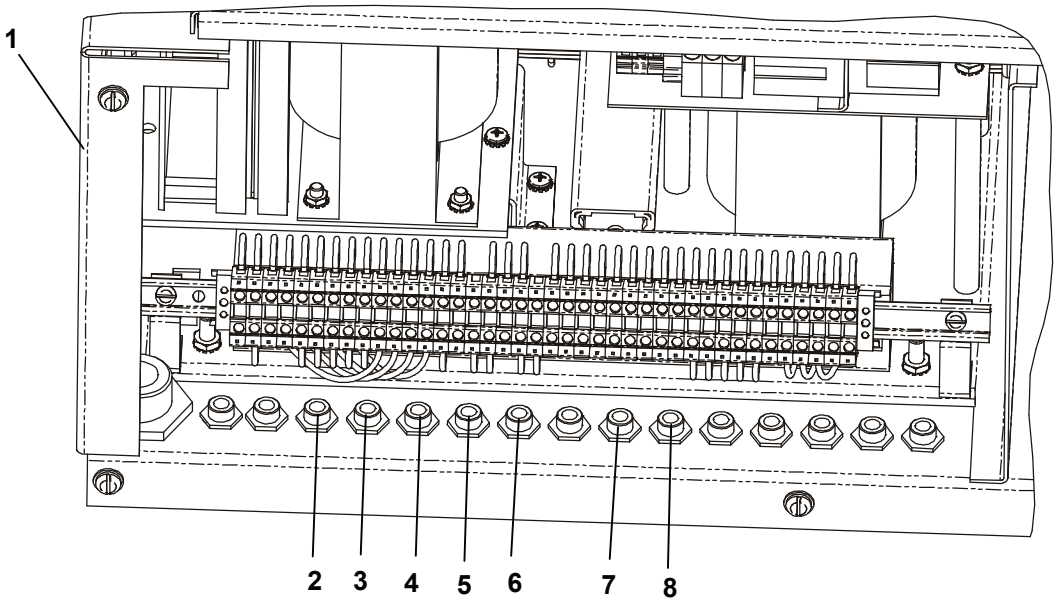


Figure 15. X1 Terminal.

Table 1. X1 Terminal Wire Locations.

Item Number	Component/Wire Name	Wire Positions (Color)
2	Calcium Inhibitor Solenoid	24 (brown) and 25 (blue)
3	Fuel Level Indicator	10 (brown) and 11 (blue)
4	Safety System Pressure Switch	12 (black) and 13 (black)
5	Low Water Shortage Switch	15 (black) and 16 (black)
6	Burner Fuel Pump Solenoid	31 (black) and 32 (black)
7	Water Pump Clutch	29 (brown) and 33 (blue)
8	Engine Generator	40 (black), 41 (red), and 42 (black)

REMOVAL – CONTINUED

20. Remove two hex head screws from throttle lever assembly (Figure 16, Item 3) on bottom of control box.

NOTE

Nuts are permanently fixed to throttle lever adapter plate.

21. Remove two screws securing throttle lever adapter plate (Figure 16, Item 2) to bottom of control box. Retain throttle lever adapter plate and two screws.

22. Remove two hex head screws securing metering valve mounting plate (Figure 16, Item 1) from bottom of control box.

23. Pull individual component wiring through retaining bracket towards the engine side.

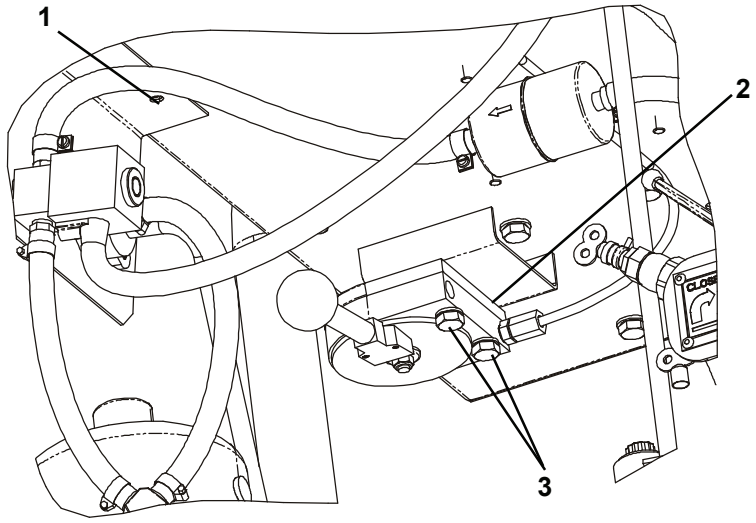


Figure 16. Bottom of Control Box.

CAUTION

When the control box mounting bolts are removed, the control box is unsupported and will fall causing damage to equipment.

24. Remove four hex head screws and lock washers securing control box to applicator module frame assembly. Screws are located in each corner inside control box. Note amount of flat washers at each mounting point between control box and frame assembly.

25. Remove the control box from either side of frame assembly.

END OF TASK

INSTALLATION

WARNING

HEAVY OBJECTS

The control box, due to size and weight, requires a two-person lift for removal and installation. Always avoid back injury by lifting with your legs.

1. Loosen four retaining bolts (Figure 13, Item 1) on control panel cover (Figure 13, Item 2) of new control box assembly and remove cover.
2. Loosen and remove five screws and washers (Figure 14, Item 1) securing new control box rear panel (Figure 14, Item 2) and remove panel.
3. Place new control box assembly on frame assembly. Insert flat washers and secure control box with four hex head screws and new lock-washers.
4. Place metering valve mounting plate (Figure 16, Item 1) onto bottom of control box and secure with two hex head screws and new lock-washers.
5. Position throttle lever adapter plate (Figure 16, Item 2) to bottom of control box and secure with two screws.
6. Secure throttle lever assembly (Figure 16, Item 3) to bottom of control box with two screws and lock-washers.
7. Route individual component cables through retaining bracket to their respective components. Tighten wire retaining nuts.
8. Facing rear of control box reconnect the tagged wires to the X1 terminal as indicated in Figure 15 and Table 1 of the Removal instructions. Tighten wire retaining nuts. Remove wire tags.
9. Install control box rear panel (Figure 14, Item 1) and secure with five screws and washers (Figure 14, Item 2).
10. Install control panel cover (Figure 13, Item 2) and secure with four retaining bolts (Figure 13, Item 1).
11. Slide photo cell (Figure 12, Item 1) all the way into holding device on top of burner.
12. Reinstall igniter plugs (Figure 11, Item 1) onto igniter electrodes.
13. Reattach burner top cover (Figure 10, Item 2) and secure with three acorn nuts and new lock-washers (Figure 10, Item 1).
14. Connect solenoid wire (Figure 8, Item 1), ground cable (Figure 9, Item 1) and power cable (Figure 8, Item 2) to starter.
15. Install thermostat sensor bulb assembly (Figure 7, Item 1) and tighten.
16. Secure thermostat cable underneath burner bottom with cable tie.

INSTALLATION - CONTINUED

17. Secure wiring harness bundle with sufficient number of cable ties (Figure 6, Item 1), ensuring that at least two ties are securing main wire harness to retainer.
18. Replace wiring bundle retaining cap (Figure 5, Item 1).
19. Connect engine air intake pre-heater wire (Figure 4, Item 1).
20. Connect engine oil pre-heater wire (Figure 3, Item 2).
21. Position throttle cable bracket onto engine oil drain plug mounting plate assembly and secure with throttle cable bracket mounting bolt (Figure 3, Item 1) and copper gaskets.
22. Reinstall right side engine mounting bolts (Figure 2, Item 1) and tighten.
23. Fill engine through filler opening with 15W-40 engine oil until upper marking of dipstick is reached (oil quantity required, approximately 1 quart).
24. Reinstall filler cap. Tighten cap enough to prevent entry of dust and dirt.
25. Reconnect applicator module battery.
    a. Attach positive terminal connector and protective cover to battery.
    b. Attach negative terminal connector and protective cover to battery.
    c. Close terminal protective covers.
    d. Install cable ties to negative and positive battery cables.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
CONTROL PANEL LIGHT REPLACEMENT

INITIAL SETUP:

Test Equipment
Not Applicable

Personnel Required
Equipment Repairer/Mechanic

Tools
Tool Kit, General Mechanic (WP 0082, Item 2)

References
TM 3-4230-238-10

Materials/Parts
Light Emitting Diode (WP 0071 Items 21, 22, 23 or 24)
Tags, Marking (WP 0083, Item 12)

Equipment Condition
Applicator module set on level ground
Engine off and cool

REMOVAL

WARNING

ELECTRICAL CHEMICAL EYE PROTECTION

Always disconnect battery cables before performing maintenance to prevent electrical shock which could cause injury or death. Always wear eye protection and protective gloves when handling the battery.

1. Disconnect battery.
   a. Unclip negative terminal protective cover.
   b. Remove negative terminal connector from battery.
2. Loosen four bolts (Figure 1, Item 1) on control panel cover (Figure 1, Item 2).
3. Remove control panel cover (Figure 1, Item 2).

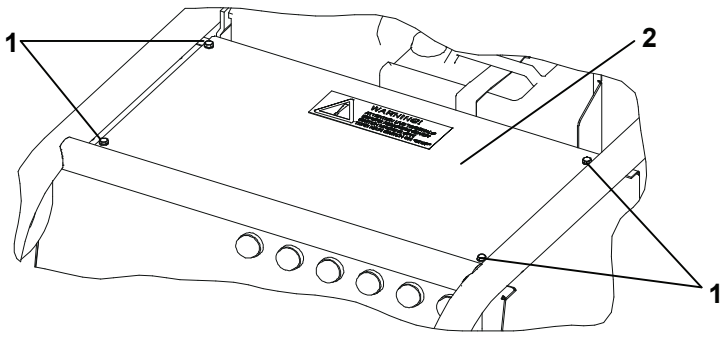


Figure 1. Control Panel Cover - Removal.

REMOVAL - CONTINUED

4. Remove light mounting nut (Figure 2, Item 5).
5. Pull light (Figure 2, Item 2) through front of control panel (Figure 2, Item 1).
6. Tag wiring (Figure 2, Item 3 and 4).
7. Loosen screws (Figure 2, Items 6 and 7) and remove wiring (Figure 2, Items 3 and 4) from light (Figure 2, Item 2).
8. Remove and discard defective light (Figure 2, Item 2).

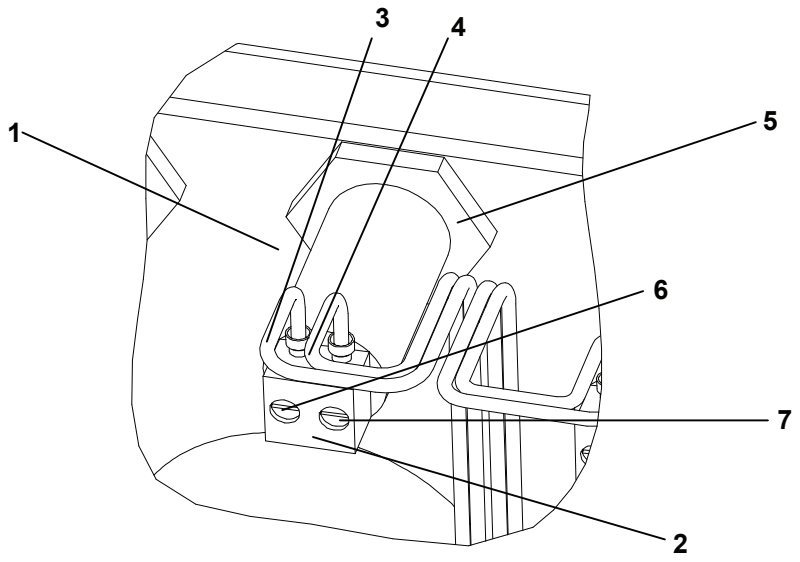


Figure 2. Control Panel Assembly - Removal.

END OF TASK

INSTALLATION

1. Remove mounting nut (Figure 3, Item 5) from light and place tagged wires through mounting nut (Figure 3, Item 5).

2. Feed tagged wires through mounting hole for light in control panel (Figure 3, Item 1).

3. Attach wiring (Figure 3, Items 3 and 4) to light (Figure 3, Item 2). Tighten screws (Figure 3, Items 6 and 7) in light connector (Figure 3, Item 2) to secure wire connection.

4. Remove wire marking tags from wires.

5. Place new light (Figure 3, Item 2) into front control panel (Figure 3, Item 1) and secure with mounting nut (Figure 3, Item 5).

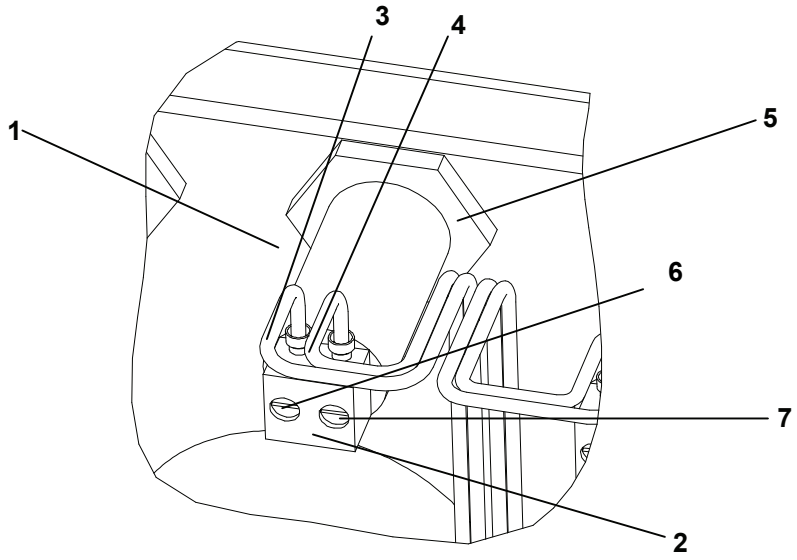


Figure 3. Control Panel Assembly - Installation.

6. Install control panel cover. Secure cover with four bolts.
7. Reconnect battery.
   a. Attach negative terminal connector.
   b. Close terminal protective cover.
8. Operate applicator module (Operator's Manual, WP 0008) and check control panel light.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
STARTER, CONTROL, IGNITION AND CHEMISTRY PUMP FUSE REPLACEMENT

INITIAL SETUP:

Test Equipment
Not Applicable

Tools
Tool Kit, General Mechanic (WP 0082, Item 2)

Materials/Parts
Fuses, 2A, 7.5A, 20A, 25A (WP 0071, Items 30, 31, 32, and 33)

Personnel Required
Equipment Repairer/Mechanic

References
Not Applicable

Equipment Condition
Applicator module set on level ground
Engine off and cool

REMOVAL

WARNING

ELECTRICAL CHEMICAL EYE PROTECTION

Always disconnect battery cables before performing maintenance to prevent electrical shock which could cause injury or death. Always wear eye protection and protective gloves when handling the battery.

1. Disconnect battery.
   a. Unclip negative terminal protective cover.
   b. Remove negative terminal connector from battery.
2. Loosen four bolts (Figure 1, Item 1) on control panel cover (Figure 1, Item 2).
3. Remove control panel cover (Figure 1, Item 2).

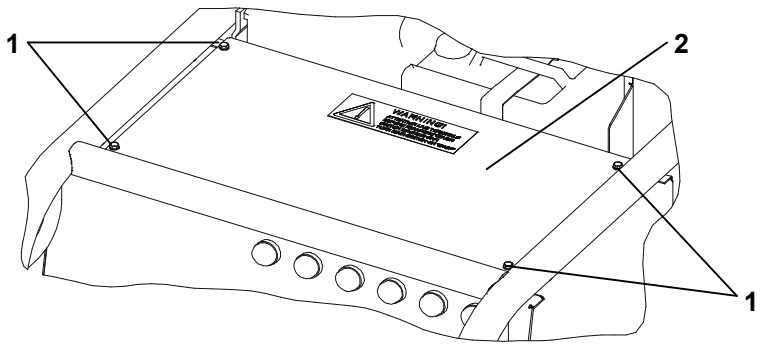


Figure 1. Control Panel Cover - Removal.

REMOVAL - CONTINUED

4. Remove defective:
   a. Starter fuse (Figure 2, Item 3), function control fuse (Figure 2, Item 2), and chemistry pump fuse (Figure 2, Item 1) by pulling straight up on defective fuse.
   b. Ignition transformer fuse (Figure 2, Item 4) by lifting fuse housing. Open fuse housing door (Figure 2, Item 5), tilt door outward to eject fuse.

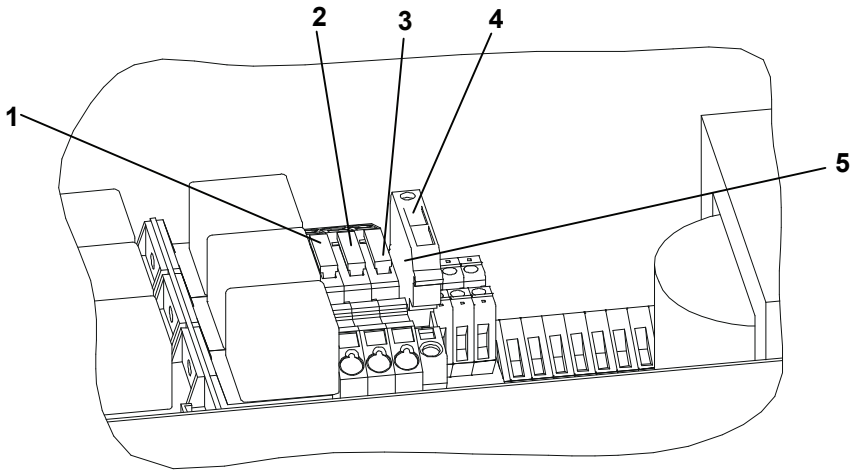


Figure 2. Control Box Assembly - Inside.

Table 1. Fuses in Control Box

(1) CHEMISTRY PUMP FUSE	**7.5 AMP (Non-functional)**
(2) FUNCTION CONTROL FUSE	**20 AMP**
(3) STARTER FUSE	**25 AMP**
(4) IGNITION TRANSFORMER FUSE	**2 AMP**

END OF TASK

INSTALLATION

1. Install:
   a. Starter fuse (Figure 2, Item 3), function control fuse (Figure 2, Item 2), or chemistry pump fuse (Figure 2, Item 1) by aligning fuse blades to fuse receptacle and pushing down on fuse.
   b. Ignition transformer fuse (Figure 2, Item 4) by inserting fuse into fuse receptacle and closing fuse housing door (Figure 2, Item 5).,
2. Replace control panel cover (Figure 3, Item 2).
3. Secure four bolts (Figure 3, Item 1) on control panel cover (Figure 3, Item 2).

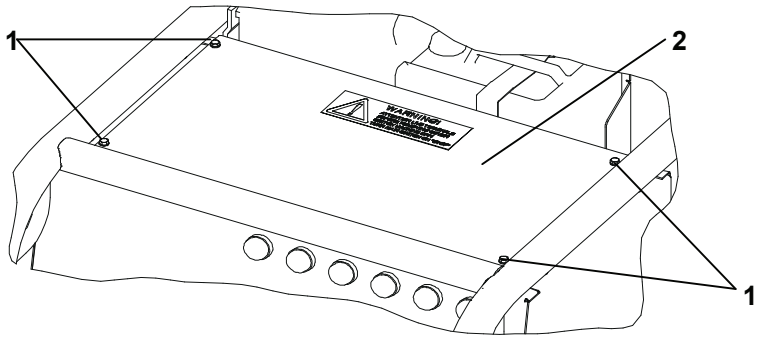


Figure 3. Control Panel Cover - Installation.

4. Reconnect battery.
   a. Attach negative terminal connector.
   b. Close terminal protective cover.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
ELECTRICAL RELAY REPLACEMENT

INITIAL SETUP:

Test Equipment
Not Applicable

Personnel Required
Equipment Repairer/Mechanic

Tools
Tool Kit, General Mechanic (WP 0082, Item 2)

References
Not Applicable

Materials/Parts
Relay, Electromagnetic (WP 0071, Item 25)
Relay, Electromagnetic (WP 0071, Item 26)
Relay, Electromagnetic (5) (WP 0071, Item 29)
Tags, Marking (WP 0083, Item 12)

Equipment Condition
Applicator module set on level ground
Engine off and cool

REMOVAL

WARNING

ELECTRICAL CHEMICAL EYE PROTECTION

Always disconnect battery cables before performing maintenance to prevent electrical shock which could cause injury or death. Always wear eye protection and protective gloves when handling the battery.

1. Disconnect applicator module battery.
   a. Unclip negative terminal protective cover.
   b. Remove negative terminal connector from battery.
2. Loosen four bolts (Figure 1, Item 1) on control panel cover (Figure 1, Item 2).
3. Remove control panel cover (Figure 1, Item 2).

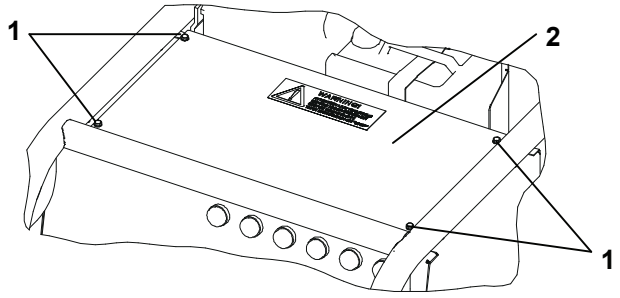


Figure 1. Control Panel Cover - Removal.

REMOVAL - CONTINUED

4. Remove defective relay:

   a. Pull straight up on defective relay (Figure 2, Items 1-4, 6 or 7) to remove it from control box assembly. Refer to Figure 2 and Table 1 to identify location of defective relay

   b. Remove starter relay (Figure 2, Item 5):

      i. Remove and tag wires from starter relay (Figure 3, Item 1).

      ii. Remove two hex screws, washers and nuts (Figure 3, Item 2) from starter relay.

      iii. Remove starter relay (Figure 2, Item 5).

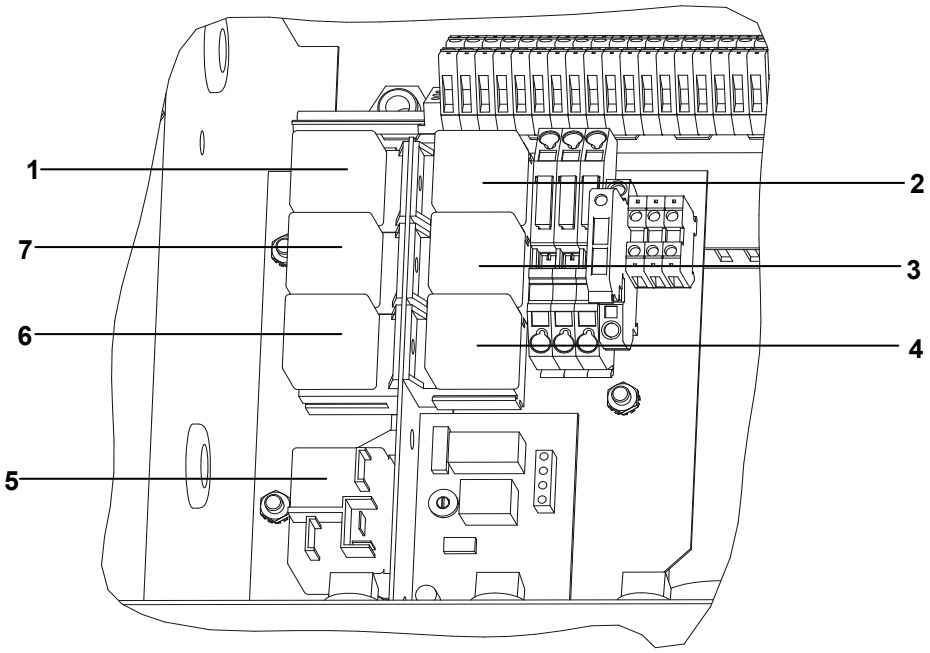


Figure 2. Relay Locations in Control Box.

NOTE

Relays #1, #2, #3, #4, and #7 all have the same NSN.

Table 1. Relay Locations in Control Box.

(1) WATER SHORTAGE RELAY	**(5) STARTER RELAY (Reference given for location only.)**
(2) ELECTROMAGNETIC RELAY	**(6) CLUTCH RELAY**
(3) IGNITION TRANSFORMER RELAY	**(7) CALCIUM INHIBITOR RELAY**
(4) PRE-PRESSURE PUMP RELAY	

REMOVAL - CONTINUED

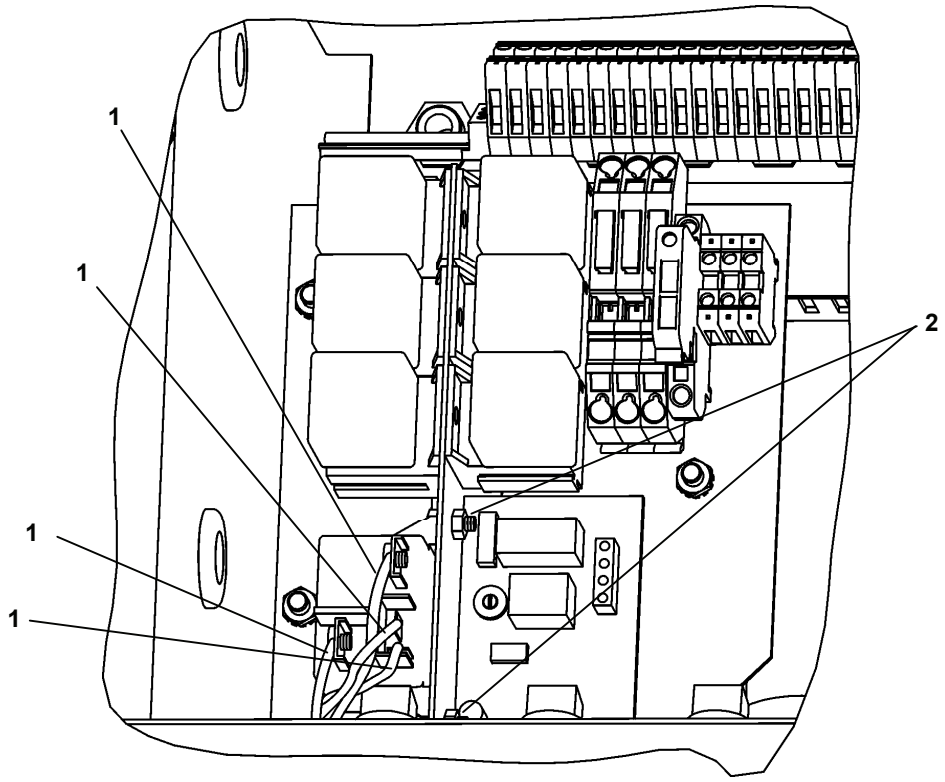


Figure 3. Starter Relay Replacement

END OF TASK

INSTALLATION

1. Install replacement relay:

    a. Push relay (Figure 2, Items 1-4, 6 or 7) down on relay slot. Refer to Figure 2 and Table 1 to identify location of replacement relay.

    b. Install starter relay (Figure 2, Item 5):

        i. Remove tags and install wires (Figure 3, Item 1) on starter relay (Figure 2, Item 5).

        ii. Install two hex screws, washers and nuts (Figure 3, Item 2) to secure starter relay.

INSTALLATION - CONTINUED

2. Replace control panel cover (Figure 4, Item 2).

3. Tighten four bolts (Figure 4, Item 1) on control panel cover (Figure 4, Item 2).

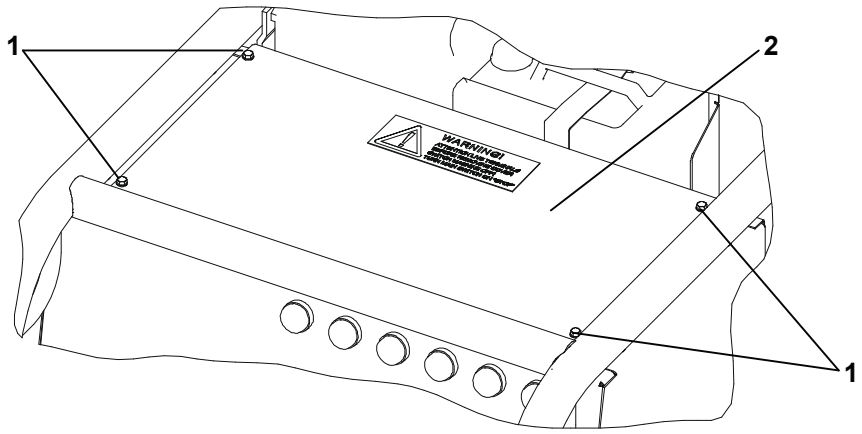


Figure 4. Control Panel Cover - Installation.

4. Reconnect applicator module battery.

   a. Attach negative terminal connector.

   b. Attach terminal protective cover.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
SELECTOR SWITCH INSPECTION AND REPLACEMENT

INITIAL SETUP:

Test Equipment
Not Applicable

Personnel Required
Equipment Repairer/Mechanic

Tools
Tool Kit, General Mechanic (WP 0082, Item 2)

References
TM 3-4230-238-10

Materials/Parts
Switch Rotary (WP 0071, Item 18)
Nut, Plain, Hex (3) (WP 0071, Item 34)
Cloth, Cleaning (WP 0083, Item 3)
Strap, Tiedown electrical (WP 0083, Item 11)

Equipment Condition
Applicator module set on level ground
Engine off and cool

INSPECTION

WARNING

ELECTRICAL CHEMICAL EYE PROTECTION

Always disconnect battery cables before performing maintenance to prevent electrical shock which could cause injury or death. Always wear eye protection and protective gloves when handling the battery.

1. Disconnect battery.
   a. Unclip negative terminal protective cover.
   b. Remove negative terminal connector from battery.
2. Loosen four bolts (Figure 1, Item 1) on control panel cover (Figure 1, Item 2).
3. Remove control panel cover (Figure 1, Item 2).

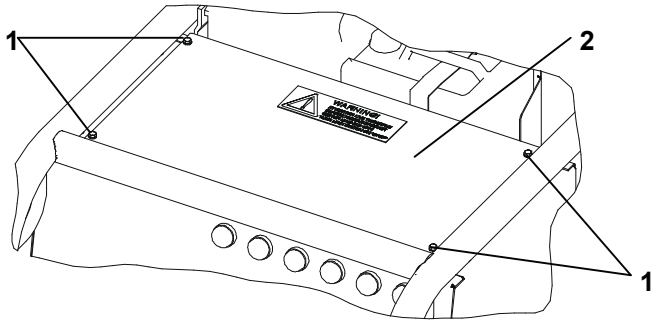


Figure 1. Control Panel Cover - Removal.

INSPECTION - CONTINUED

4. Inspect wire connections on selector switch for loose or disconnected wires.
5. Tighten loose wires and reconnect any disconnected wires to selector switch. Wires are labeled for their connection location. Refer to Fold Outs in the back of this manual (FO 1-3) for wire connection locations, if required.
6. Depress starter button (Figure 2, Item 3) and release. Starter button should operate freely.
7. If there is binding of starter button perform the following steps:
   a. Loosen center screw (Figure 2, Item 1) that attaches red starter button (Figure 2, Item 3) on selector switch (Figure 2, Item 2) until starter button can be removed.
   b. Remove starter button (Figure 2, Item 3).
   c. Inspect for debris or corrosion on inside of starter button (Figure 2, Item 3). Remove debris or corrosion.
   d. Re-install starter button (Figure 2, Item 3) on selector switch (Figure 2, Item 2). Tighten screw.
   e. Check starter button (Figure 2, Item 3) operation. Starter button (Figure 2, Item 3) should operate freely.

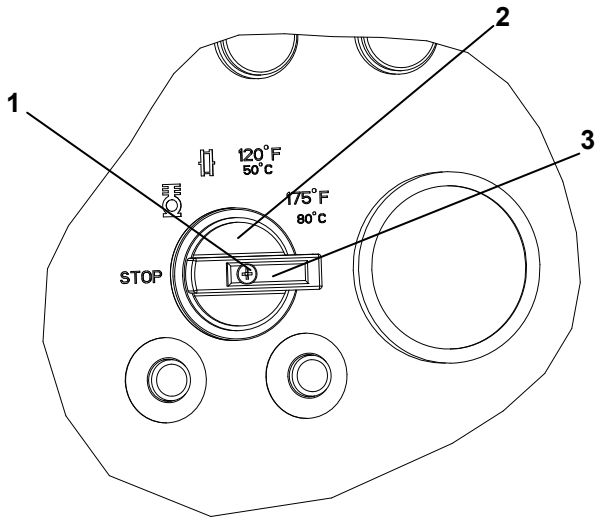


Figure 2. Selector Switch.

8. Rotate selector switch (Figure 2, Item 2) through all operating modes (Operator's Manual, WP 0008). If selector switch (Figure 2, Item 2) is still binding or hard to rotate, replace selector switch (Figure 2, Item 2) using procedures from this work package.

END OF TASK

REMOVAL

NOTE

The wiring that attaches to the selector switch has several cable ties. Remove enough cable ties in order to facilitate removal and installation of the new selector switch.

1. Disconnect battery.
   a. Unclip negative terminal protective cover.
   b. Remove negative terminal connector from battery.
2. Loosen four bolts (Figure 1, Item 1) on control panel cover (Figure 1, Item 2).
3. Remove control panel cover (Figure 1, Item 2).
4. Remove three locknuts and lock washers (Figure 3, Item 1) retaining assembly plate (Figure 3, Item 2).
5. Lift off assembly plate (Figure 3, Item 2) from mount extensions.

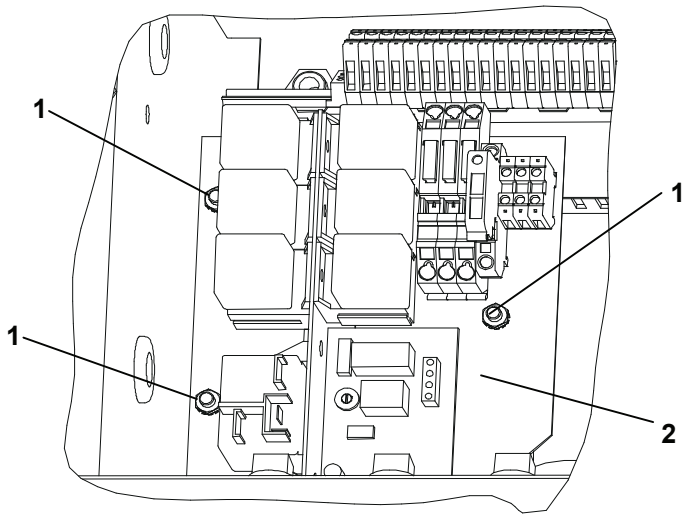


Figure 3. Control Box Assembly Plate.

6. Loosen center screw (Figure 2, Item 1) that retains red starter button (Figure 2, Item 3) on selector switch (Figure 2, Item 2) until starter button can be removed.
7. Remove starter button (Figure 2, Item 3).

NOTE

Due to improvements made to the selector switch assembly during production, applicator modules produced before the improvements will have the old style design as indicated in Figure 4. The replacement part will be the new design as indicated in Figure 5.

REMOVAL - CONTINUED

8. Determine if installed selector switch is old or new design. Remove selector switch for old design (Figure 4) follow step 8a; for new design (Figure 5) follow step 8b.

   a. Old design:

      (1) Locate selector switch retaining tabs (Figure 4, Item 2).

      (2) Apply outward pressure with small flat tip screwdriver.

      (3) Slide switch (Figure 4, Item 1) toward inside of control panel and remove switch.

   b. New design:

      (1) Locate selector switch lever (Figure 5, Item 2).

      (2) Slide lever clockwise to release selector switch (Figure 5, Item 1) from control panel.

      (3) Slide switch (Figure 5, Item 1) toward inside of control panel and remove switch.

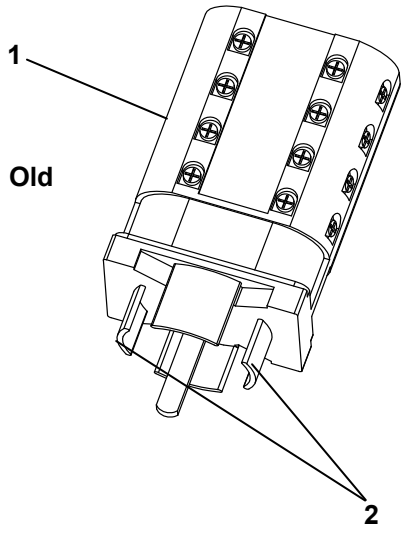


Figure 4. Selector Switch Assembly (Old).

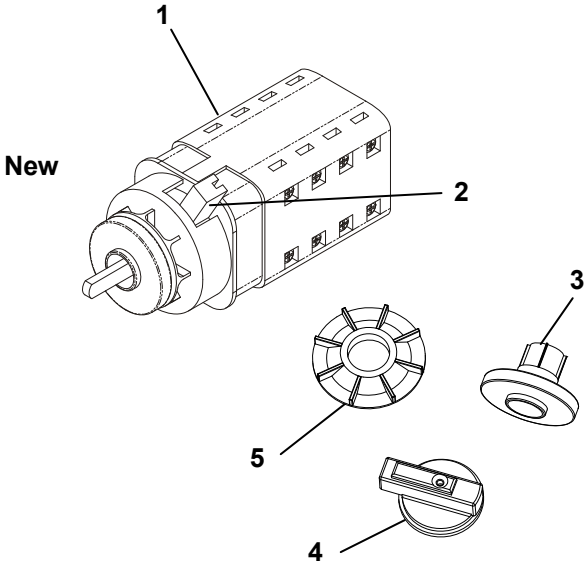


Figure 5. Selector Switch Assembly (New).

9. To remove control panel switch bezel (Figure 5, Item 5), loosen and remove bezel retaining nut (Figure 5, Item 3) by turning it counterclockwise.

END OF TASK

INSTALLATION

NOTE

The wire positions are numbered. Wires are retained by small screws through a channel.

1. Remove and install one wire at a time from old switch to new switch. This ensures correct placement of wiring.
2. Secure wiring where cable ties were previously removed.
3. Insert control panel switch bezel (Figure 5, Item 3), reinstall bezel retaining nut (Figure 5, Item 5) and new selector switch (Figure 5, Item 1).
4. Slide selector switch lever (Figure 5, Item 2) counterclockwise until it stops. Switch is now locked into control panel switch bezel (Figure 5, Item 3).
5. Install starter button assembly (Figure 5, Item 4) and secure with provided screw.
6. Install assembly plate (Figure 3, Item 2) and secure with three new lock washers and lock nuts (Figure 3, Item 1).
7. Install control box top panel (Figure 1, Item 2) and secure with four bolts (Figure 1, Item 1).
8. Connect battery.
   a. Attach negative terminal connector.
   b. Close terminal protective cover.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
HOUR METER REPLACEMENT

INITIAL SETUP:

Test Equipment
Not Applicable

Personnel Required
Equipment Repairer/Mechanic

Tools
Tool Kit, General Mechanic (WP 0082, Item 2)
Bit, star-head (WP 0082, Item 3)

References
TM 3-4230-238-10

Materials/Parts
Meter, Time (WP 0071, Item 40)
Tags, Marking (WP 0083, Item 12)
Accessory Kit (WP 0082, Item 1)

Equipment Condition
Applicator module set on level ground
Engine off and cool

REMOVAL

WARNING

ELECTRICAL CHEMICAL EYE PROTECTION

Always disconnect battery cables before performing maintenance to prevent electrical shock which could cause injury or death. Always wear eye protection and protective gloves when handling the battery.

1. Disconnect applicator module battery.
   a. Unclip negative terminal protective cover.
   b. Remove negative terminal connector from battery.
2. Loosen four bolts (Figure 1, Item 1) on control panel cover (Figure 1, Item 2).
3. Remove control panel cover (Figure 1, Item 2).

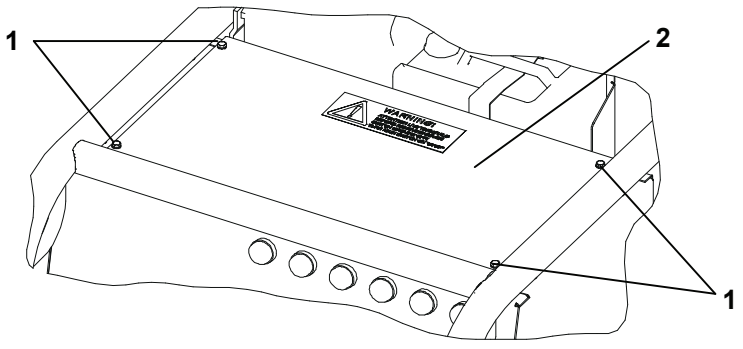


Figure 1. Control Box Assembly - Removal.

REMOVAL - CONTINUED

4. Remove two screws and nuts (Figure 2, Item 1) from the hour meter (Figure 2, Item 2).

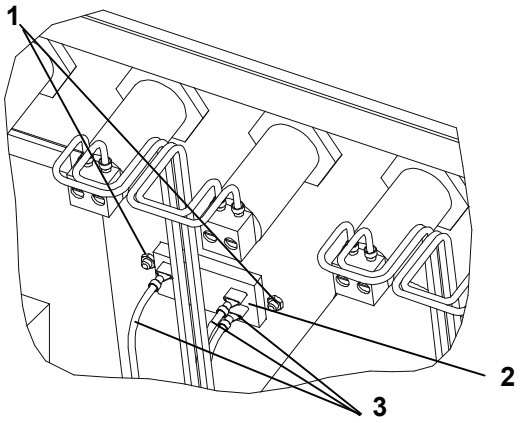


Figure 2. Back of Hour Meter - Removal.

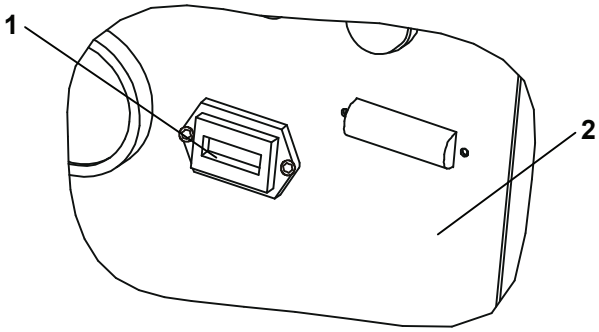


Figure 3. Hour Meter - Removal.

5. Remove hour meter (Figure 3, Item 1) through front of control panel (Figure 3, Item 2).
6. Tag and remove wiring (Figure 2, Item 3) from back of hour meter (Figure 2, Item 2).

END OF TASK

INSTALLATION

1. Reconnect wiring (Figure 2, Item 3) to back of hour meter (Figure 2, Item 2). Remove wire tags.
2. Install hour meter (Figure 3, Item 1) through front of control panel (Figure 3, Item 2).
3. Install two screws and nuts (Figure 2, Item 1) to secure hour meter (Figure 2, Item 2) to control panel.
4. Install control panel cover and secure with four bolts.
5. Reconnect applicator module battery.
   a. Attach negative terminal connector.
   b. Close terminal protective cover.

NOTE

Run engine for 10 minutes to observe hour meter operation. Do not perform WP 0006 in Operator's Manual.

6. Prepare system for use (Operator's Manual WP 0005) and then start engine (Operator's Manual WP 0007) to check hour meter for proper operation.
7. Shutdown applicator module (Operator's Manual, WP0013)

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
PREHEATER OIL AND AIR SWITCHES REPLACEMENT

INITIAL SETUP:

Test Equipment
Not Applicable

Tools
Tool Kit, General Mechanic (WP 0082, Item 2)

Materials/Parts
Switch, Push (2) (WP 0071, Item 19)
Nut, Plain, Hex (3) (WP 0071, Item 34)
Tags, Marking (WP 0083, Item 12)

Personnel Required
Equipment Repairer/Mechanic

References
Not Applicable

Equipment Condition
Applicator module set on level ground
Engine off and cool

REMOVAL

WARNING

ELECTRICAL CHEMICAL EYE PROTECTION

Always disconnect battery cables before performing maintenance to prevent electrical shock which could cause injury or death. Always wear eye protection and protective gloves when handling the battery.

1. Disconnect applicator module battery.
   a. Unclip negative terminal protective cover.
   b. Remove negative terminal connector from battery.
2. Loosen four bolts (Figure 1, Item 1) on control panel cover (Figure 1, Item 2).
3. Remove control panel cover (Figure 1, Item 2).

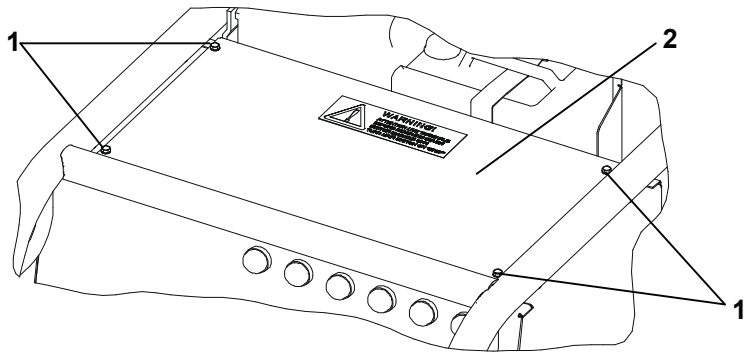


Figure 1. Control Panel Cover - Removal.

REMOVAL - CONTINUED

4. Remove three locknuts and star washers (Figure 2, Item 1) retaining assembly plate (Figure 2, Item 2).
5. Lift off assembly plate (Figure 2, Item 2) from mount extensions.

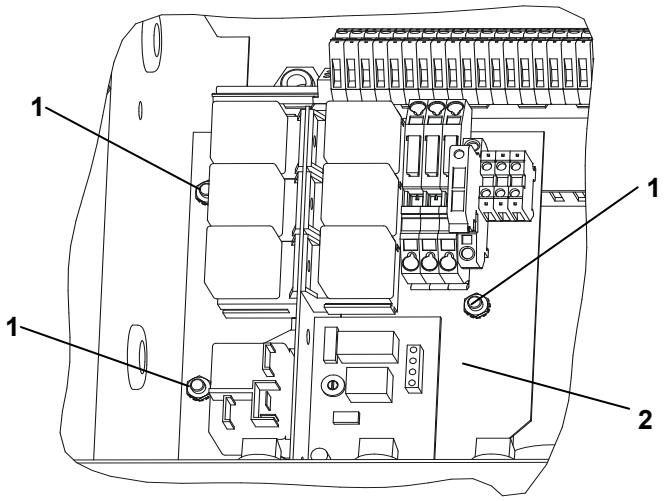


Figure 2. Control Box Assembly Plate.

6. Loosen center screw (Figure 3, Item 1) that retains red starter button (Figure 3, Item 3) on selector switch (Figure 3, Item 2) until starter button can be removed.
7. Remove starter button assembly (Figure 3, Item 3).

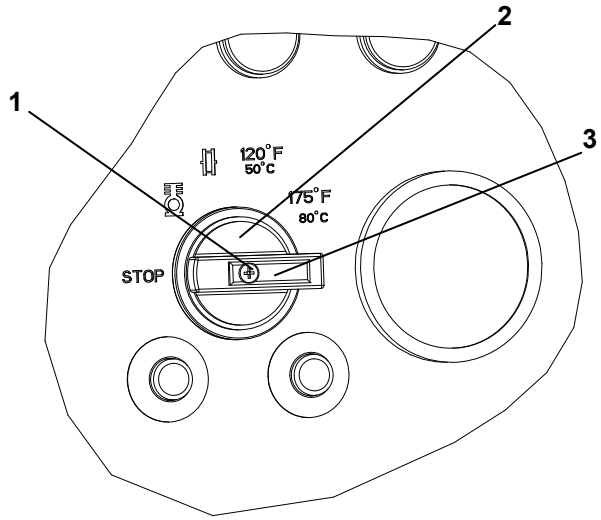


Figure 3. Control Panel Assembly - Front.

REMOVAL - CONTINUED

NOTE

Due to improvements made to the selector switch assembly during production, applicator modules produced before the improvements will have the old style design as indicated in Figure 4.

8. Determine if installed selector switch is old or new design. Remove selector switch for old design (Figure 4) follow step 8a; for new design (Figure 5) follow step 8b.

    a. Old design:

        (1) Locate selector switch retaining tabs (Figure 4, Item 2).

        (2) Apply outward pressure with small flat tip screwdriver.

        (3) Slide switch (Figure 4, Item 1) toward inside of control panel and remove switch.

    b. New design:

        (1) Locate selector switch lever (Figure 5, Item 2).

        (2) Slide lever (Figure 5, Item 2) clockwise to release selector switch (Figure 5, Item 1) from control panel.

        (3) Slide switch (Figure 5, Item 1) toward inside of control panel and remove switch.

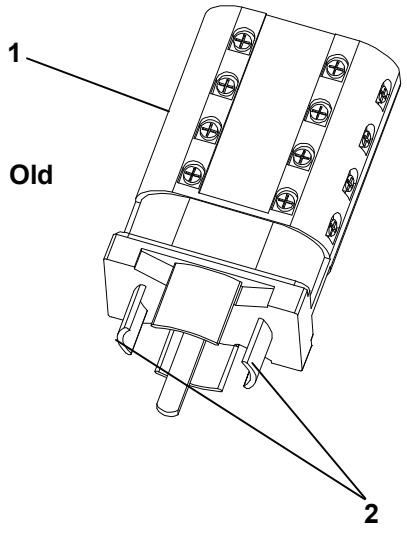


Figure 4. Selector Switch Assembly (Old).

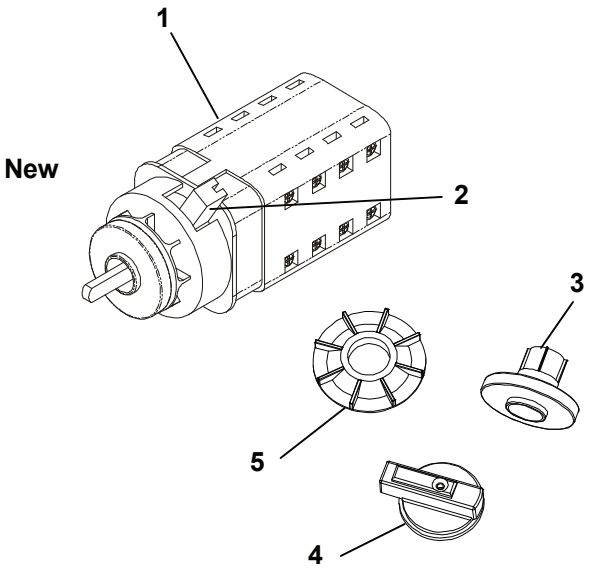


Figure 5. Selector Switch Assembly (New).

REMOVAL - CONTINUED

9. Tag and disconnect wiring (Figure 6, Item 3) on oil switch and/or air switch (Figure 6, Item 2).

10. Remove retaining nut (Figure 6, Item 1) on oil switch and/or air switch (Figure 6, Item 2).

NOTE

Figure 6 shows air switch. Oil Switch is located next to air switch and parts are identical.

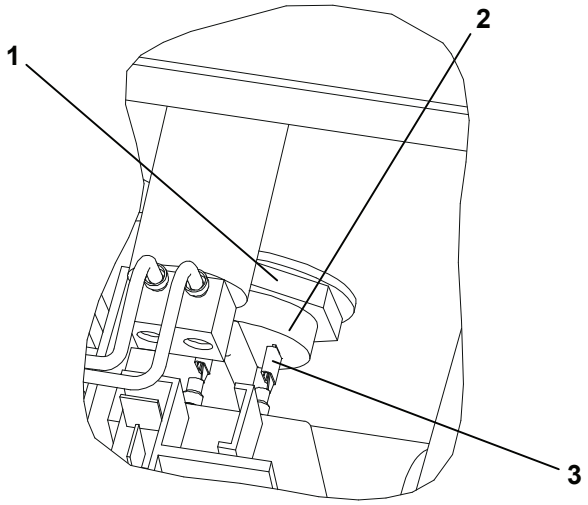


Figure 6. Air Switch.

11. Pull oil switch and/or air switch (Figure 6, Item 2) through front of control panel.

12. Remove and discard defective oil switch and/or air switch (Figure 6, Item 2).

END OF TASK

INSTALLATION

1. Place new oil and/or air switch (Figure 6, Item 2) into front of control panel.
2. Install and tighten retaining nut (Figure 6, Item 1) securing the oil and/or air switch (Figure 6, Item 2) to control panel.
3. Reconnect wiring (Figure 6, Item 3) to oil and/or air switch (Figure 6, Item 2). Remove tags.
4. Insert control panel switch bezel (Figure 5, Item 3), install bezel retaining nut (Figure 5, Item 5, and selector switch (Figure 5, Item 1).
5. Apply limited force until switch (Figure 5, Item 1) has locked into control panel switch bezel (Figure 5, Item 3), or if new switch apply limited force and slide retaining lever counterclockwise until it stops.
6. Install starter button assembly (Figure 5, Item 4) and secure with provided screw.
7. Secure wiring where cable ties were previously removed.
8. Install assembly plate (Figure 2, Item 2) and secure with three new lock nuts and star washers (Figure 2, Item 1).
9. Install control panel cover (Figure 1, Item 2) and secure with four bolts (Figure 1, Item 1).
10. Reconnect applicator module battery.
    a. Attach negative terminal connector.
    b. Close terminal protective cover.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
BURNER CONTROL CIRCUIT BREAKER REPLACEMENT

INITIAL SETUP:

Test Equipment
Not Applicable

Tools
Tool Kit, General Mechanic (WP 0082, Item 2)

Materials/Parts
Relay, Thermal (WP 0071, Item 38)
Tags, Marking (WP 0083, Item 12)
Accessory Kit, (WP 0082, Item 1)

Personnel Required
Equipment Repairer/Mechanic

References
WP 0029
TM 3-4230-238-10

Equipment Condition
Engine off and cool

REMOVAL

WARNING

ELECTRICAL CHEMICAL EYE PROTECTION

Always disconnect battery cables before performing maintenance to prevent electrical shock which could cause injury or death. Always wear eye protection and protective gloves when handling the battery.

1. Disconnect applicator module battery.
   a. Unclip negative terminal protective cover.
   b. Remove negative terminal connector.
2. Loosen four bolts (Figure 1, Item 1) on control panel cover (Figure 1, Item 2) and remove control panel cover (Figure 1, Item 2).

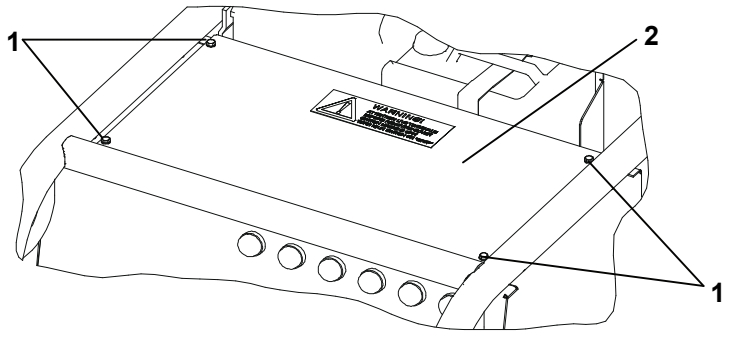


Figure 1. Control Panel Cover - Removal.

REMOVAL - CONTINUED

3. Remove burner control relay (WP 0029).

4. Remove two screws (Figure 2, Item 1) from bottom mounting of burner control circuit breaker (Figure 2, Item 2).

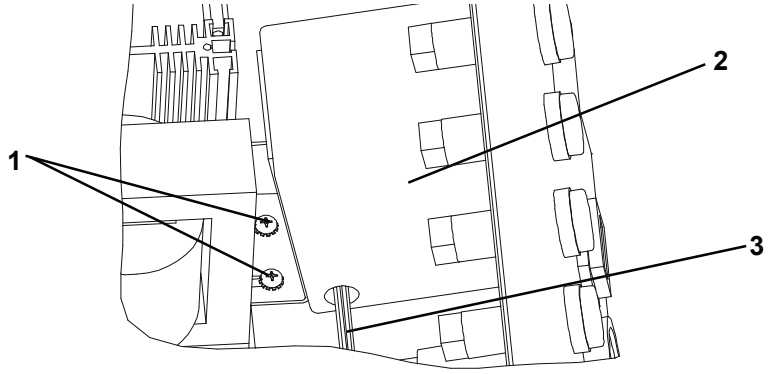


Figure 2. Circuit Breaker - Removal.

5. Remove burner control circuit breaker (Figure 2, Item 2) from control box.

6. Loosen two nuts (Figure 3, Item 1) that secure mounting bracket (Figure 3, Item 3) to circuit breaker (Figure 3, Item 2). Separate burner control circuit breaker by pulling the two pieces apart.

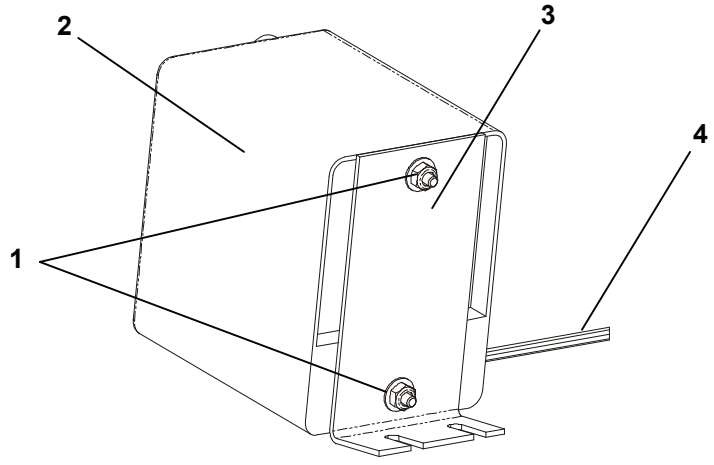


Figure 3. Circuit Breaker – Mounting Bracket Removal

7. Tag and remove wiring (Figure 3, Item 4) from burner control circuit breaker (Figure 3, Item 2).

END OF TASK

INSTALLATION

1. Install wiring (Figure 2, Item 3) to burner control circuit breaker (Figure 2, Item 2). Remove tags.
2. Reassemble the burner control circuit breaker and mounting bracket (Figure 3, Item 3) and secure with two nuts and two new lock washers (Figure 3, Item 1).
3. Install burner control circuit breaker (Figure 3, Item 2) into control box.
4. Install two screws (Figure 2, Item 1) to bottom mounting of burner control circuit breaker (Figure 2, Item 2) and tighten.
5. Install burner control relay (WP 0029).
6. Install control panel cover (Figure 1, Item 2) and tighten four bolts (Figure 1, Item 1) .
7. Reconnect applicator module battery.
   a. Attach negative terminal connector.
   b. Close terminal protective cover.
8. Operate applicator module in 120 °F and 175 °F modes of operation (Operator's Manual, WP 0008) to ensure proper operation of burner assembly.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
BURNER RECTIFIER REPLACEMENT

INITIAL SETUP:

Test Equipment
Not Applicable

Tools
Tool Kit, General Mechanic (WP 0082, Item 2)

Materials/Parts
Inverter, Power (WP 0071, Item 41)
Tags, Marking (WP 0083, Item 12)
Accessory Kit, (WP 0082, Item 1)

Personnel Required
Equipment Repairer/Mechanic

References
TM 3-4230-238-10

Equipment Condition
Applicator module set on level ground
Engine off and cool

REMOVAL

WARNING

ELECTRICAL CHEMICAL EYE PROTECTION

Always disconnect battery cables before performing maintenance to prevent electrical shock which could cause injury or death. Always wear eye protection and protective gloves when handling the battery.

1. Disconnect applicator module battery.
   a. Unclip negative terminal protective cover.
   b. Remove negative terminal connector from battery.
2. Loosen four bolts (Figure 1, Item 1) on control panel cover (Figure 1, Item 2) and remove control panel cover (Figure 1, Item 2).

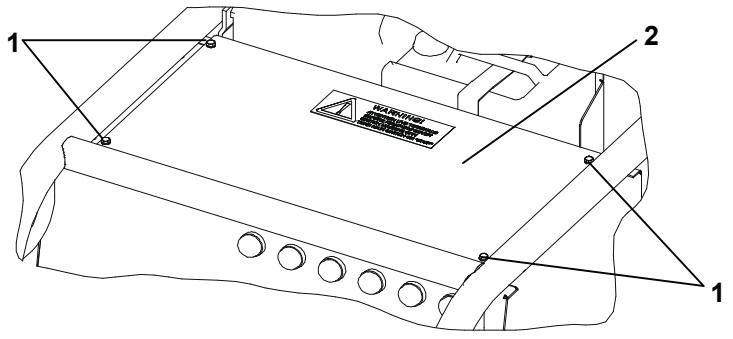


Figure 1. Control Panel Cover - Removal.

REMOVAL - CONTINUED

3. Tag and disconnect four wires (yellow, red, brown, and black) (Figure 2, Items 1, 2, 3, and 4).

4. Release tension on wire retainer (Figure 3, Item 1) by inserting small screwdriver.

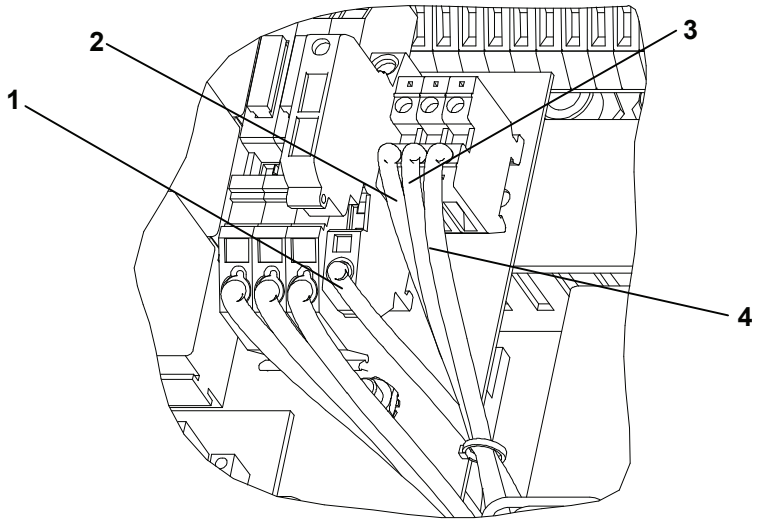


Figure 2. Output Rectifier Wiring Connections.

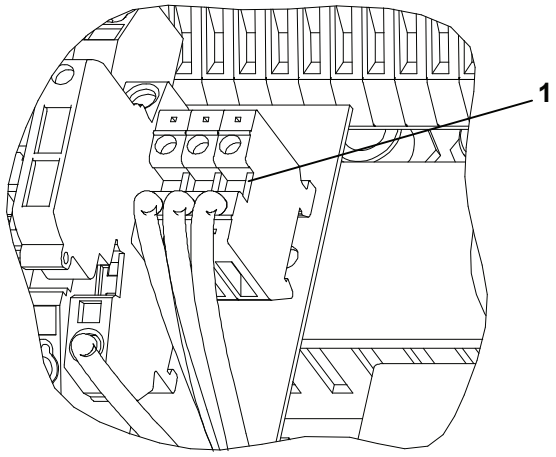


Figure 3. Rectifier Wire Release.

REMOVAL - CONTINUED

5. Remove three hex head nuts (Figure 4, Item 1) to remove rectifier from its mounting position.
6. Move rectifier up and over stud and release it from control box mounting plate. Do not completely remove rectifier from control box at this time.

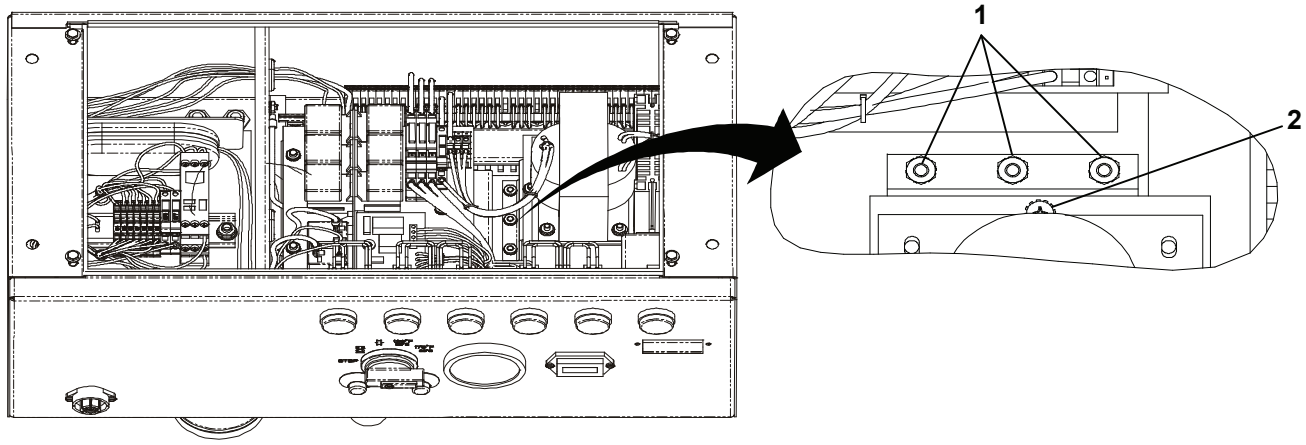


Figure 4. Hex Head Nuts - Removal.

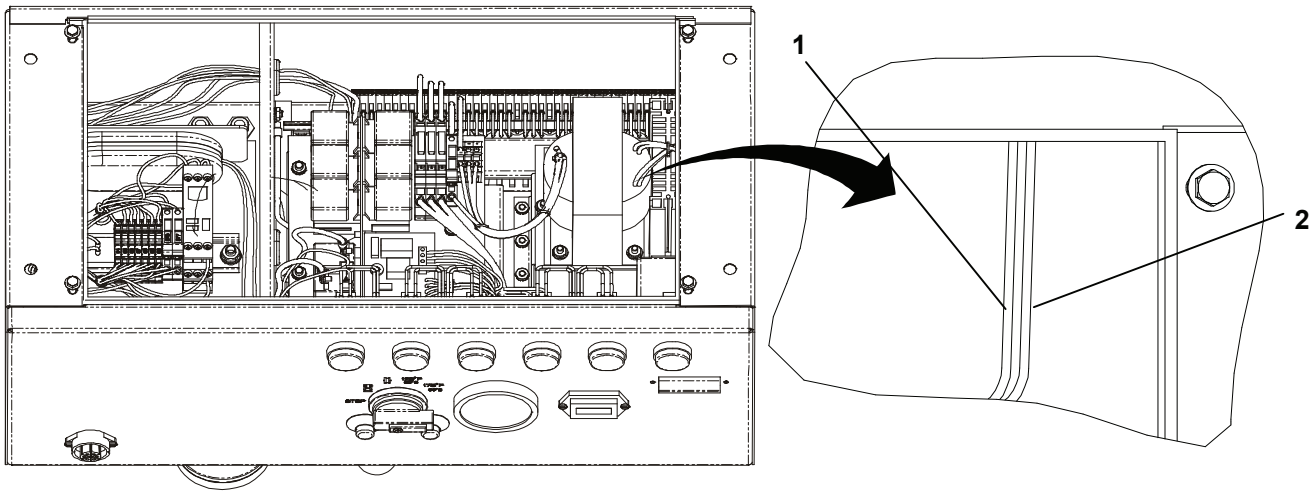


Figure 5. Input Rectifier Wiring - Removal.

REMOVAL - CONTINUED

7. Holding rectifier out of its mounting area, pull and disconnect two electrical supply wires (Figure 5, Items 1 and 2); one wire is positive (red) and the other wire is negative (blue). Note wires' color markings and their position on rectifier.

8. Remove rectifier from control box.

9. Remove two screws (Figure 4, Item 2) from rectifier mounting plate assembly. Note position of rectifier mounting plate assembly.

10. Remove rectifier from mounting plate assembly and retain mounting plate assembly for installation of replacement rectifier.

END OF TASK

INSTALLATION

1. Attach rectifier mounting plate assembly to rectifier and secure with two screws (Figure 6, Item 2).

CAUTION

If wires are incorrectly connected; damage to equipment may occur.

NOTE

Observe and note the correct positioning of the wiring connections to the rectifier. There are symbols indicating wire locations, marked by + and – near connection points on rectifier.

2. Install electrical supply wires to rectifier (Figure 5, Items 1 and 2), one wire is positive (red) and the other wire is negative (blue).

3. Position rectifier on control box assembly plate rear mounting area ensuring that rear mounting tabs are located in control box assembly plate cut outs.

4. Install three hex head nuts (Figure 6, Item 1) and tighten.

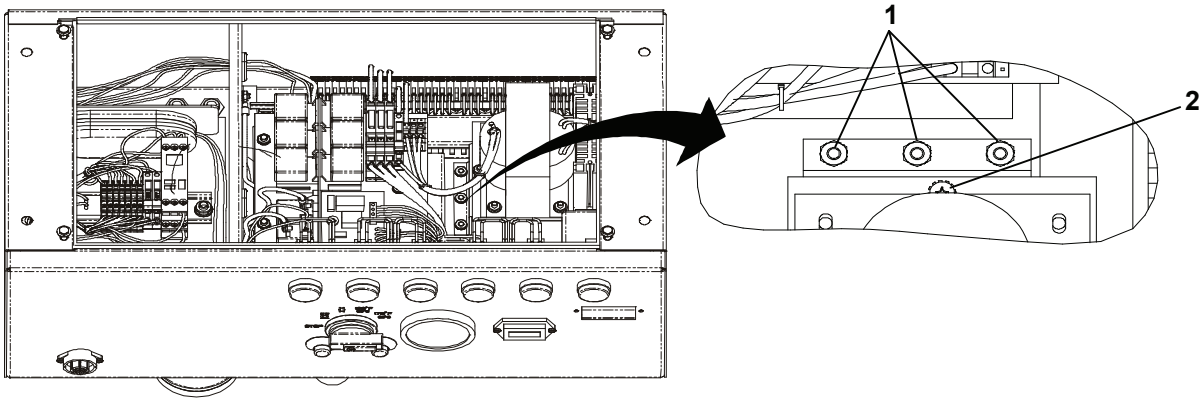


Figure 6. Hex Head Nuts - Installation.

INSTALLATION - CONTINUED

5. Release tension on wire retainer (Figure 7, Item 4).
6. Connect four wires (Figure 7, Items 1 = yellow, 2 = red, 3 = brown, and 5 = black) in their respective mounting positions. Remove wire tags.

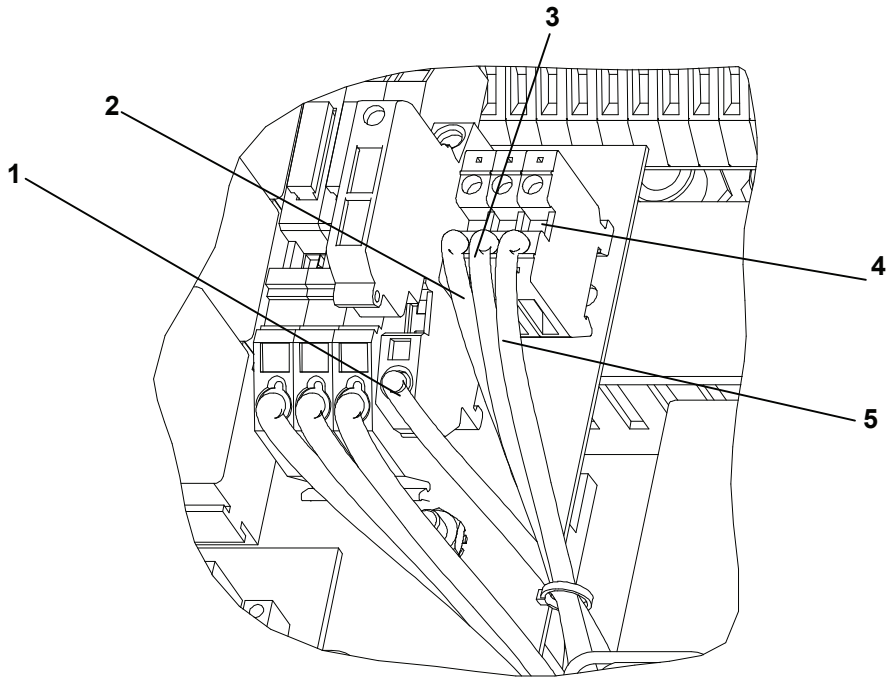


Figure 7. Output Rectifier Wiring Connections.

7. Install control panel cover and tighten with four bolts.
8. Reconnect applicator module battery.
   a. Attach negative terminal connector.
   b. Close terminal protective covers.
9. Operate applicator module in 120 °F and 175 °F modes of operation (Operator's Manual, WP 0008) to ensure proper operation of burner assembly.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
TEMPERATURE GAUGE FUNCTIONAL TEST AND GAUGE/THERMOSTAT REPLACEMENT

INITIAL SETUP:

Test Equipment
Temperature Reader (WP 0082, Item 4)

Tools
Tool Kit, General Mechanic (WP 0082, Item 2)

Materials/Parts
Regulator, Temperature (WP 0071, Item 20)
Strap, Tiedown electrical (WP 0083, Item 11)
Cloth, Cleaning (WP 0083, Item 3)
Tags, Marking (WP 0083, Item 12)
Accessory Kit (WP 0082, Item 1)

Personnel Required
Equipment Repairer/Mechanic (2)

References
TM 3-4230-238-10

Equipment Condition
Preparation for Use completed (Operator's Manual, WP 0005)
Applicator module set on level ground
Engine off and cool

TEMPERATURE GAUGE FUNCTIONAL TEST

Person 1:

1. Verify applicator module has been prepared for use (Operator's Manual, WP 0005).
2. Position applicator module where water can drain from water outlet (Figure 1, Item 1).

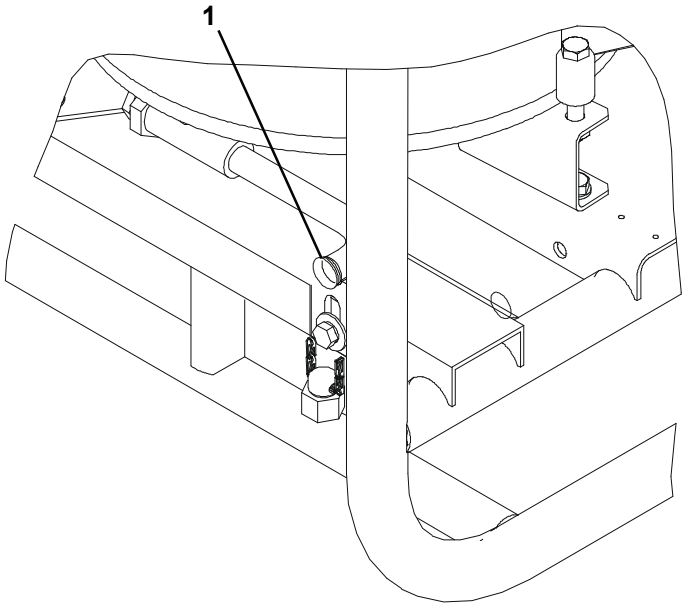


Figure 1. Water Outlet.

TEMPERATURE GAUGE FUNCTIONAL TEST - CONTINUED

3. Start engine (Operator's Manual, WP0007).
4. Operate applicator module in high-pressure cleaning with cold water mode (Operator's Manual WP0008).
   a. Set selector switch (Figure 2, Item 1) on control panel to pump operating mode (Figure 2, Item 3).
   b. Operate applicator module for 2-3 minutes.
5. Set selector switch (Figure 2, Item 1) on control panel to 120 °F/50 °C (Figure 2, Item 4).

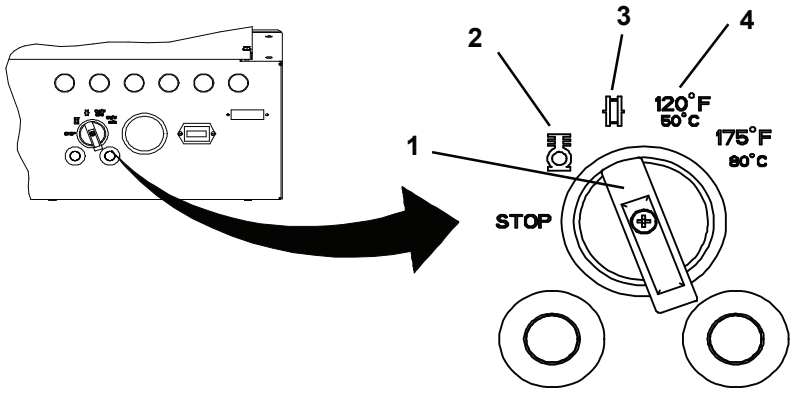


Figure 2. Selector Switch – Pump Position.

6. Run applicator module until burner indicator light (Figure 3, Item 1) goes out.

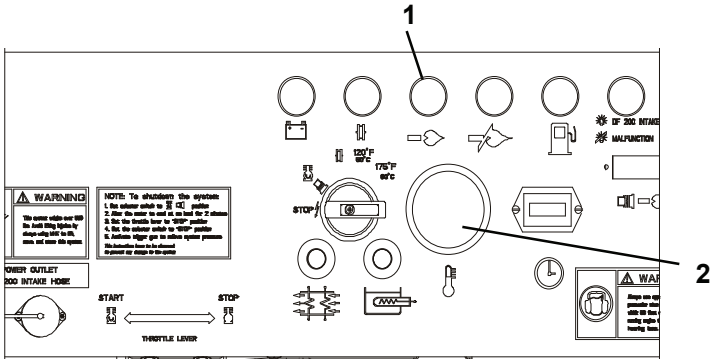


Figure 3. Control Panel Assembly.

7. Turn selector switch (Figure 2, Item 1) to engine start position (Figure 2, Item 2) and set throttle lever to engine idle position.

TEMPERATURE GAUGE FUNCTIONAL TEST – CONTINUED

Person 1:

8. Observe temperature gauge (Figure 3, Item 2) reading on control panel indicated by black needle.

Person 2:

9. Using temperature reader, record the water temperature at water outlet.

10. Compare temperature readings from temperature gauge (Figure 3, Item 2) and high pressure hose. Temperatures should be plus or minus 5 °F. If temperature gauge reading is more than 5 °F above or below 120 °F/50 °C, replace gauge. Refer to gauge replacement task located within this work package.

Person 1:

11. Turn selector switch (Figure 2, Item 1) to pump position (Figure 2, Item 3). Allow water to circulate through applicator module for 2-3 minutes.

12. Shutdown applicator module (Operator's Manual WP0013).

END OF TASK

REMOVAL

WARNING

ELECTRICAL CHEMICAL EYE PROTECTION HIGH PRESSURE

Always disconnect battery cables before performing maintenance to prevent electrical shock which could cause injury or death. Always wear eye protection and protective gloves when handling the battery.

Contents under high pressure in equipment can cause serious bodily injury when the pressure is not properly released before handling the equipment. Wear eye protection and protective clothing when handling equipment under high pressure.

NOTE

Ensure that the applicator module is not under any water pressure.

1. Disconnect applicator module battery.
   a. Unclip negative terminal protective cover.
   b. Remove negative terminal connector from battery.

REMOVAL - CONTINUED

2. Remove calcium inhibitor container from applicator module.
3. Loosen and remove thermostat sensor bulb assembly (Figure 4, Item 1) and remove reducer/adapter (Figure 4, Item 2) located at the burner high-pressure outlet (Figure 4, Item 3).
4. Remove cable tie securing thermostat sensor cable to high-pressure outlet hose.

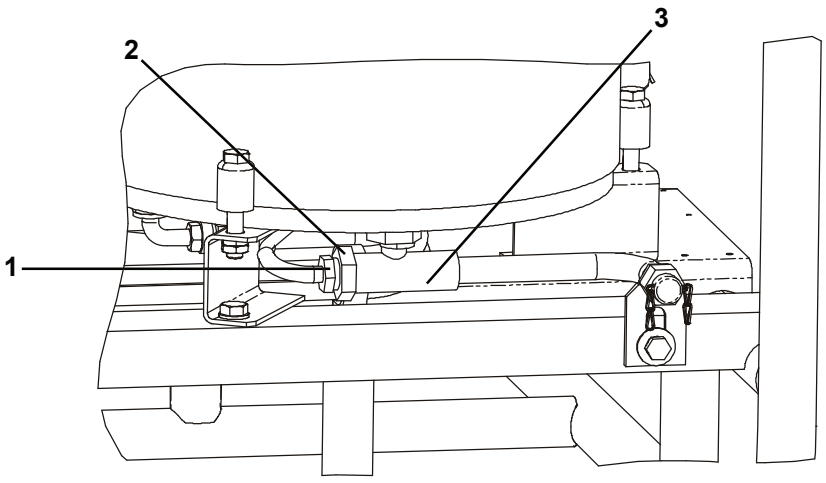


Figure 4. Thermostat Sensor/Reducer & Adapter.

5. Remove wiring harness bundle retaining cap. (Figure 5, Item 1).
6. Remove all cable ties (Figure 6, Item 1) located along the wiring harness bundle, from the bottom of the burner assembly to the control box that retain wiring harness bundle.

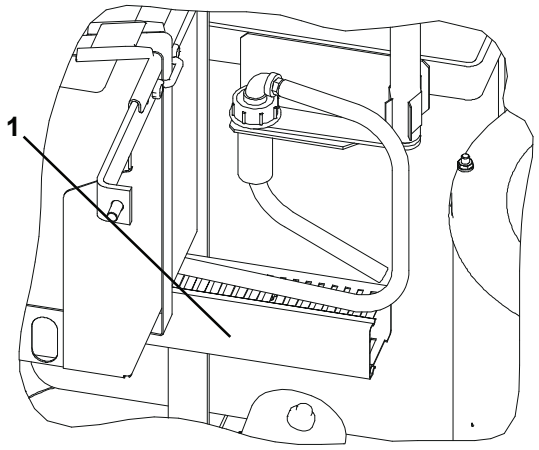


Figure 5. Wiring Harness Bundle Retaining Cap.

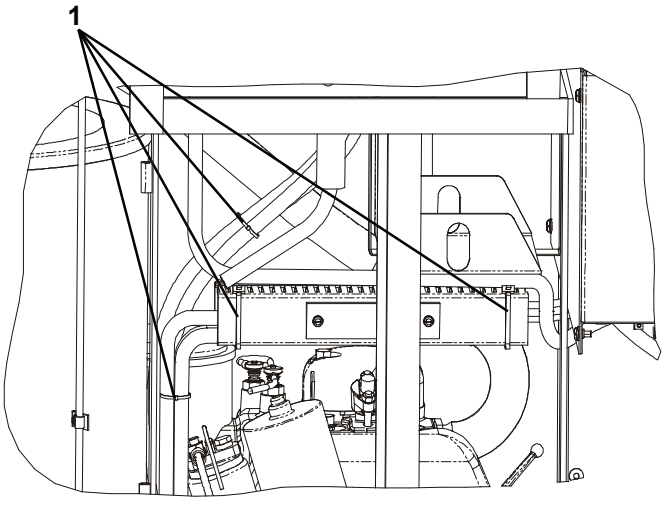


Figure 6. Wiring Harness Bundle - Reverse View.

REMOVAL - CONTINUED

7. Loosen wiring bulkhead retaining nut (Figure 7, Item 1) and slide nut down cables.
8. Loosen four bolts on control panel cover and remove control panel cover.
9. Loosen and remove five retaining screws (Figure 7, Item 2) and washers from rear control panel cover.
10. Remove rear panel by sliding panel outward to the side.

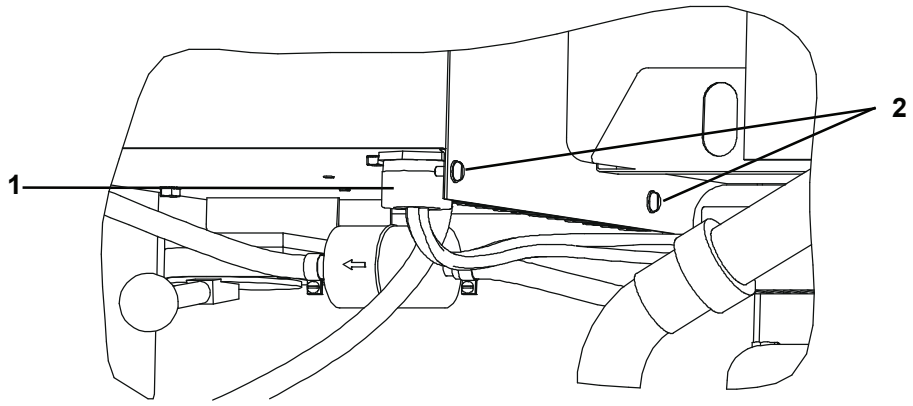


Figure 7. Bulkhead Wiring Retainer - Removal.

11. Remove top cover to wiring harness retainers (Figure 8, Item 1).
12. Isolate thermostat cable from wiring harness retainers and maneuver cable through bulkhead retaining nut, plastic washer, and rubber grommet inside of control box.
13. Isolate thermostat cable throughout wiring harness bundle; maneuver cable and probe assembly through bulkhead retaining nut, plastic washer, and rubber grommet and up inside of control box.

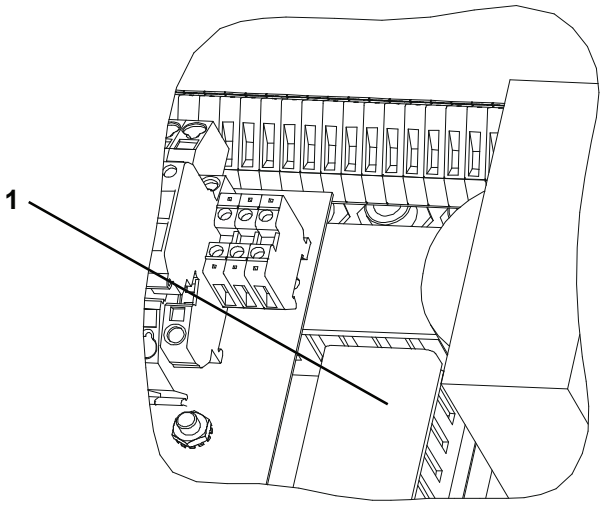


Figure 8. Wiring Harness Retainer - Removal.

REMOVAL - CONTINUED

14. Remove crossbar bracket (Figure 9, Item 1) as follows:
    a. Loosen, but do not remove plastic knurled retaining nuts securing crossbar bracket (Figure 9, Item 1) to thermostat housing (Figure 9, Item 2). Rotate thermostat (Figure 9, Item 3) 90 degrees right, if necessary, to gain access.
    b. Note positioning of crossbar bracket (Figure 9, Item 1) and remove retaining nuts and crossbar bracket.
15. Carefully, without disconnecting four wires on thermostat, pull thermostat through to front of control panel until thermostat probe can be pulled through and put off to outside of control panel.
16. Note the exact location of and tag four wires (Figure 9, Item 4) that are connected to back of thermostat (Figure 9, Item 3).
17. Remove four wires from back of thermostat (Figure 9, Item 3). Discard gauge/thermostat.

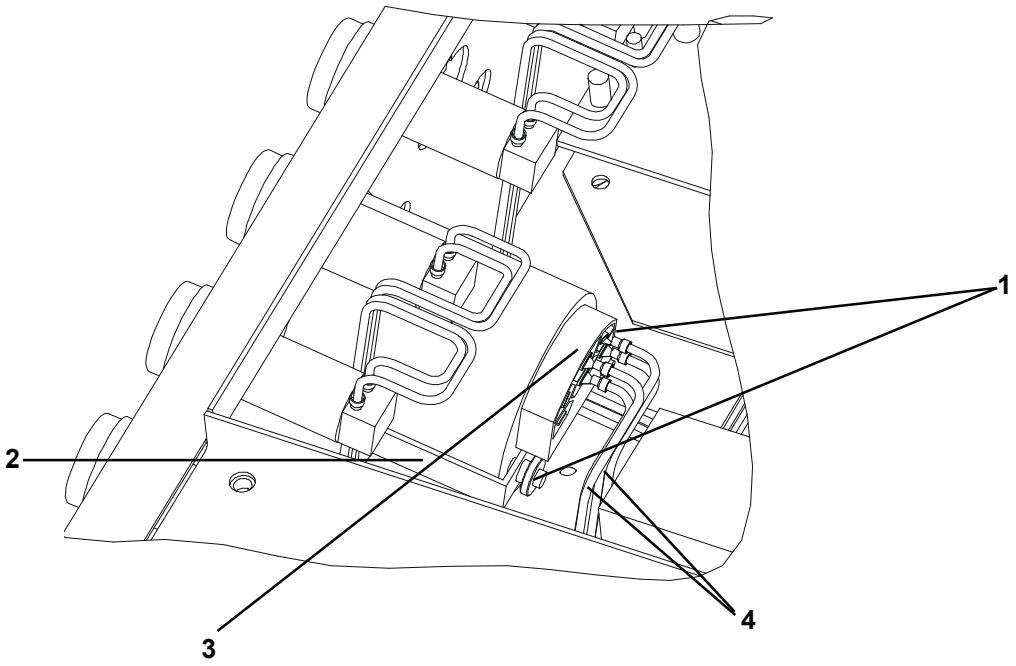


Figure 9. Rear of Thermostat - Removal.

END OF TASK

INSTALLATION

1. Insert thermostat sensor and cable through gauge opening on front of control panel.
2. Connect four wires (Figure 10, Item 4) to back of gauge/thermostat (Figure 10, Item 3) one at a time. Refer to wire location notes or wire markings noted in the removal task of this work package. Remove wire tags.
3. Install thermostat sensor.
    a. Maneuver thermostat sensor and cable through control box bulkhead retainer, rubber grommet, plastic gasket, and bulkhead retainer nut.
    b. Pull excess sensor cable through bulkhead retainer, leaving enough cable so that positioning of sensor and cable is possible within wire bundle retainers.
    c. Position thermostat sensor and cable main wire bundle below burner unit.
    d. Install thermostat sensor into water outlet (Figure 4, Item 3).
4. Install temperature gauge as follows:
    a. With gauge in position and bezel flush mounted to control panel, attach cross bar bracket (Figure 10, Item 2) to rear of gauge from inside of control box. The cut out on the bar should face up.
    b. Attach plastic knurled retaining nuts (Figure 10, Item 1) securing cross bar bracket (Figure 10, Item 2) to gauge housing.
    c. Position gauge so it can be read from front of control panel. Tighten two retaining nuts (Figure 10, Item 1) to secure gauge.

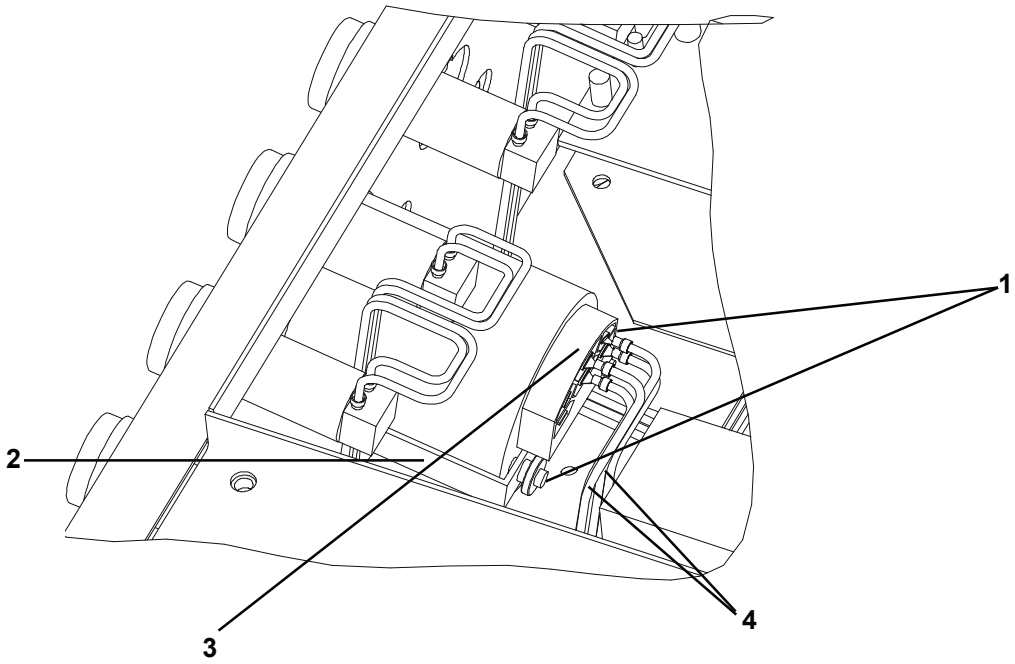


Figure 10. Rear of Gauge - Installation.

INSTALLATION - CONTINUED

5. Align and place component wiring into wiring harness retainers, ensuring that wires are not pinched or positioned so that they may become cut or damaged.
6. Install control box wiring harness retainer covers (Figure 11, Item 1).
7. Install rear control box panel as follows:
   a. Position rubber grommet, plastic washer up and into bulkhead retainer.
   b. Slide bulkhead retainer nut up to bulkhead retainer and secure.
   c. Install rear control box panel. Secure with five screws and washers.

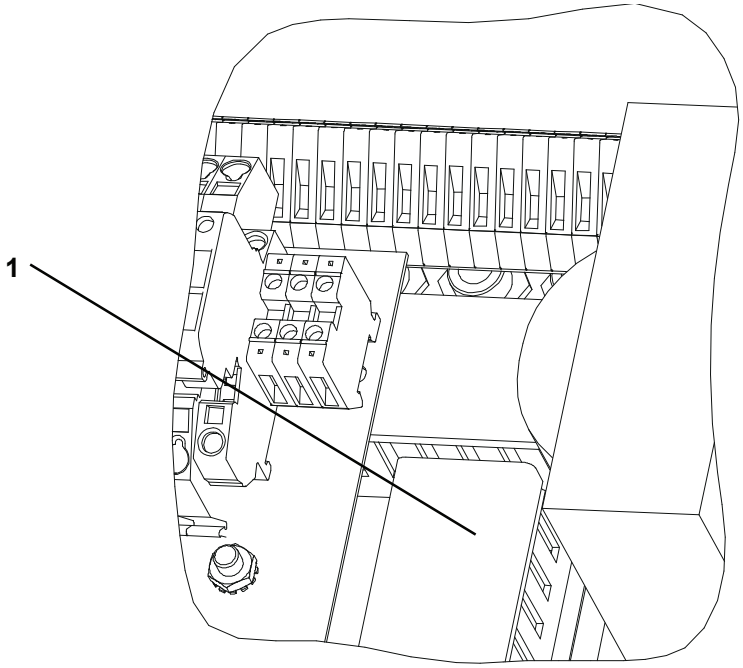


Figure 11. Wiring Harness Retainer - Installation.

INSTALLATION - CONTINUED

8. Secure wiring harness with sufficient number of cable ties, ensuring that at least two ties are securing main wiring harness bundle to retainer (Figure 12, Item 1). Also ensure that thermostat cable is secured underneath burner bottom with cable tie.

9. Install control panel cover and tighten four bolts.

10. Install calcium inhibitor container.

11. Reconnect applicator module battery.

    a. Attach negative terminal connector.

    b. Close terminal protective cover.

12. Perform functional test in this work package. Check applicator module for water leaks.

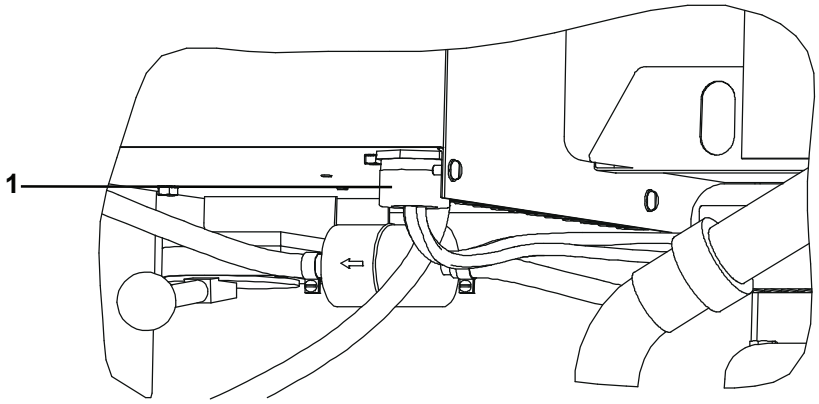


Figure 12. Bulkhead Wiring Retainer - Installation.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
CHARGING SYSTEM REGULATOR TEST AND REPLACEMENT

INITIAL SETUP:

Test Equipment
Volt/Ohm Meter (WP 0082, Item 3)

Personnel Required
Equipment Repairer/Mechanic

Tools
Tool Kit, General Mechanic (WP 0082, Item 2)

References
TM 3-4230-238-10

Materials/Parts
Regulator, Engine (WP 0071, Item 43)
Nut, Plain, Hex (3) (WP 0071, Item 34)

Equipment Condition
Applicator module set on level ground
Engine off and cool

TEST

WARNING

ELECTRICAL **CHEMICAL** **EYE PROTECTION**

Use caution when performing maintenance on electrical components to prevent shock. Shock will cause injuries or death. Always wear eye protection and protective gloves.

1. Set Volt/Ohm meter for measuring DC voltage.
2. Take battery voltage reading. Reading should be at least 12.5 volts.
3. Start engine and let it idle (Operator's Manual, WP 0007).
4. Measure voltage output at battery. Reading should be at least 12.5 volts.
5. Measure voltage at full throttle. The reading should be between 13.2 - 14.5 volts. If not, replace regulator.

END OF TASK

REMOVAL

1. Disconnect applicator module battery.
   a. Unclip negative terminal protective cover.
   b. Remove negative terminal connector from battery.

REMOVAL-CONTINUED

2. Loosen four bolts (Figure 1, Item 1) on control panel cover (Figure 1, Item 2) and remove cover.

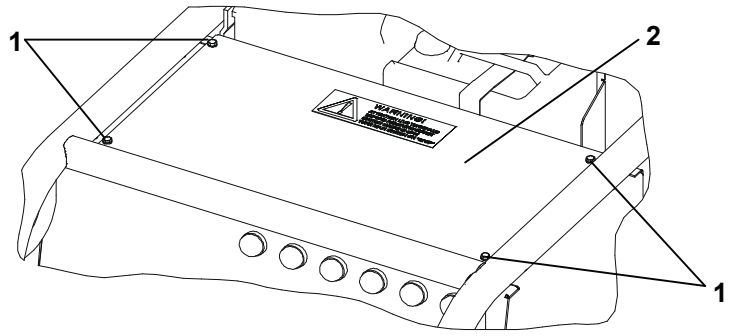


Figure 1. Control Panel Cover- Removal.

3. Remove three lock nuts and star washers (Figure 2, Item 1) retaining assembly plate (Figure 2, Item 2).
4. Lift off assembly plate (Figure 2, Item 2) from mount extensions.

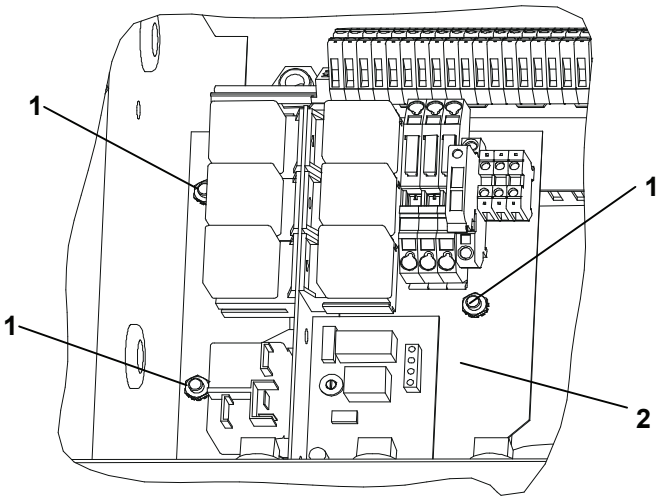


Figure 2. Control Box Assembly Plate.

REMOVAL-CONTINUED

5. Loosen center screw (Figure 3, Item 1) that retains red starter button (Figure 3, Item 3) on selector switch (Figure 3, Item 2) until starter button can be removed.
6. Remove starter button assembly (Figure 3, Item 3).

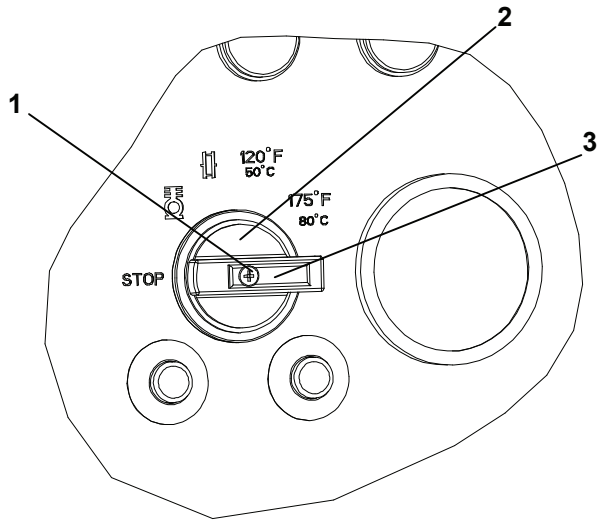


Figure 3. Control Panel Assembly – Front

NOTE

Due to improvements made to the selector switch assembly during production, applicator modules produced before the improvements will have the old style design as indicated in Figure 4.

7. Determine if installed selector switch is old or new design. Remove selector switch for old design (Figure 4) follow step 7a; for new design (Figure 5) follow step 7b.

   a. Old design

      (1) Locate selector switch retaining tabs (Figure 4, Item 2)

      (4) Apply outward pressure with small flat tip screwdriver.

      (5) Slide switch (Figure 4, Item 1) toward inside of control panel and remove switch.

REMOVAL-CONTINUED

b. New design:

(1) Locate selector switch lever (Figure 5, Item 2)

(2) Slide lever clockwise to release selector switch (Figure 5, Item 1) from control panel.

(3) Slide switch (Figure 5, Item 1) toward inside of control panel and remove switch.

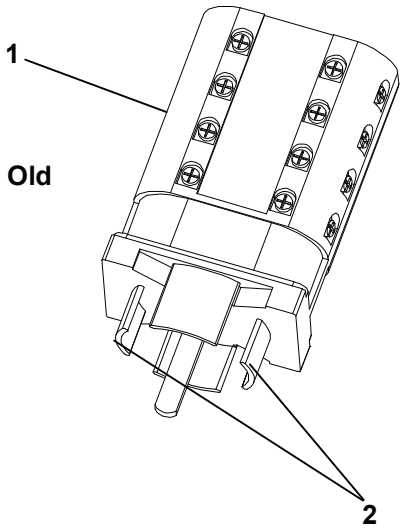


Figure 4. Selector Switch Assembly (Old).

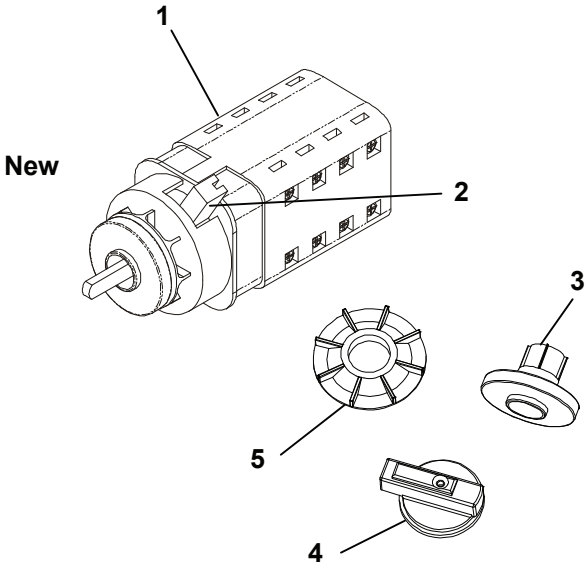


Figure 5. Selector Switch Assembly (New).

8. To remove control panel switch bezel (Figure 5, Item 3), loosen and remove bezel retaining nut (Figure 5, Item 5) by turning it counterclockwise.

9. Loosen and remove two screws (Figure 6, Item 1) that retain regulator (Figure 6, Item 2) to control box lower assembly plate (Figure 6, Item 4).

10. Disconnect regulator wiring harness connector (Figure 6, Item 3) from regulator (Figure 6, Item 2) and remove regulator.

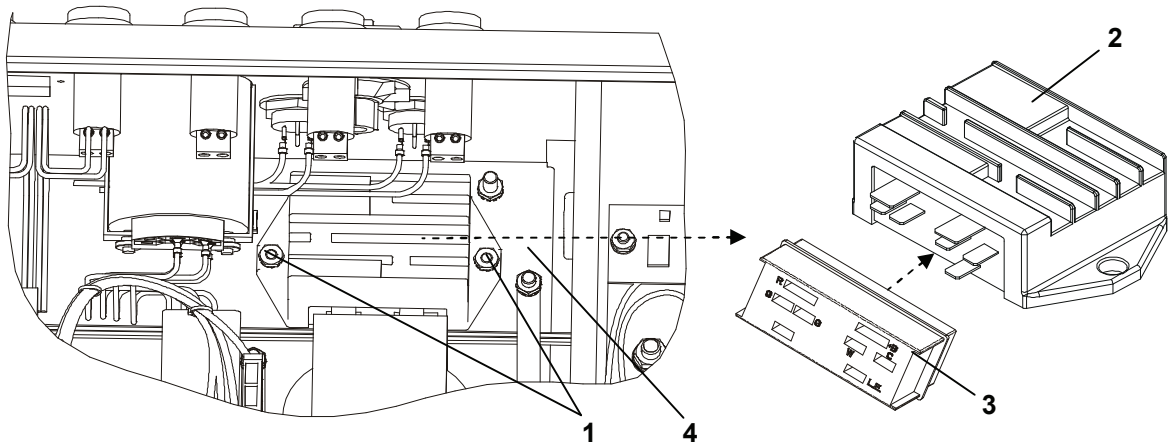


Figure 6. Regulator.

END OF TASK

INSTALLATION

1. Install regulator wiring harness connector (Figure 6, Item 3) to regulator (Figure 6, Item 2).
2. Position regulator (Figure 6, Item 2) on control box lower assembly plate (Figure 6, Item 4).
3. Install two screws (Figure 6, Item 1) and tighten.
4. Slide selector switch lever (Figure 5, Item 2) counterclockwise until it stops. Switch is now locked into control panel switch bezel (Figure 5, Item 3).
5. Install starter button assembly (Figure 5, Item 4) and secure with provided screw.
6. Install assembly plate (Figure 2, Item 2) and secure with three lock washers and new lock nuts (Figure 2, Item 1).
7. Install control box top panel (Figure 1, Item 2) and secure with four bolts (Figure 1, Item 1).
8. Connect battery.
    a. Attach negative terminal connector.
    b. Close terminal protective cover.
9. Start applicator module (Operator's Manual, WP 0007).
10. Perform test in this work package.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
CALCIUM INHIBITOR FILTER REPLACEMENT

INITIAL SETUP:

Test Equipment
Not Applicable

Tools
Tool Kit, General Mechanic (WP 0082, Item 2)

Materials/Parts
Filter Fluid (WP 0072, Item 16)
Pan, Drain (WP 0083, Item 8)

Personnel Required
Equipment Repairer/Mechanic

Reference
Not Applicable

Equipment Condition
Applicator module set on level ground
Engine off and cool

REMOVAL

1. Unscrew cap and remove hose from calcium inhibitor container.
2. Loosen hose clamps (Figure 1, Item 2) at inlet and outlet of filter element (Figure 1, Item 3) and slide hose clamps (Figure 1, Item 2) back onto hoses (Figure 1, Item 1).
3. Using drain pan, catch residual calcium inhibitor from the hoses and filter element (Figure 1, Item 3).
4. Remove inlet and outlet hoses from the filter element (Figure 1, Item 3). Drain filter element (Figure 1, Item 3) into drain pan.
5. Dispose of filter element (Figure 1, Item 3).

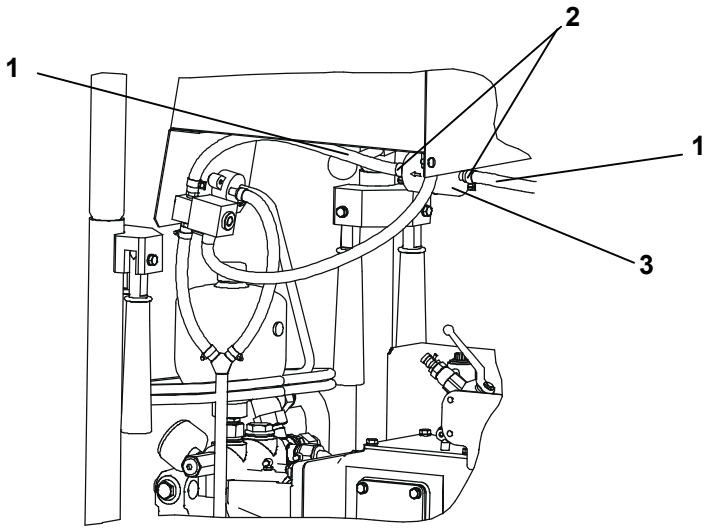


Figure 1. Calcium Inhibitor Filter - Removal.

END OF TASK

INSTALLATION

1. Observe direction arrow on replacement filter element (Figure 2, Item 3). The arrow points in outward direction.
2. Insert inlet and outlet hoses (Figure 2, Item 1) onto replacement filter element (Figure 2, Item 3).
3. Slide and align hose clamps (Figure 2, Item 2) on inlet and outlet hoses (Figure 2, Item 1).
4. Tighten hose clamps (Figure 2, Item 2).
5. Insert hose into calcium inhibitor container and secure.

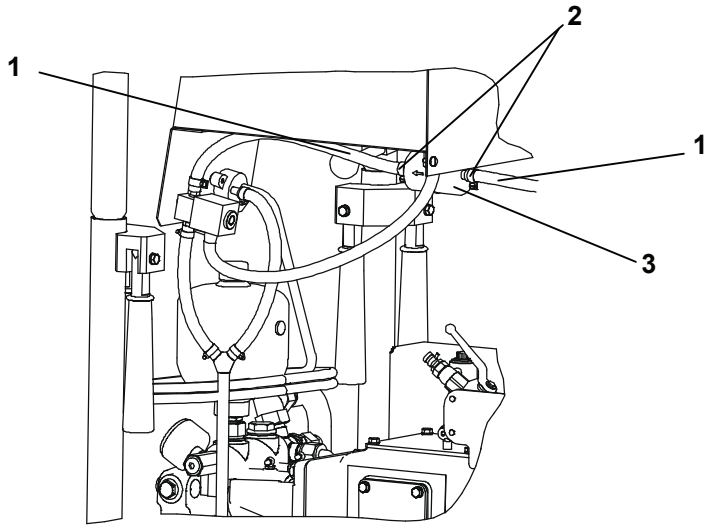


Figure 2. Calcium Inhibitor Filter - Installation.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
HIGH-PRESSURE BURNER OUTLET REPLACEMENT

INITIAL SETUP:

Test Equipment
Not Applicable

Tools
Tool Kit, General Mechanic (WP 0082, Item 2)

Materials/Parts
Tube Assembly, Metal (WP 0072, Item 5)
Cloth, Cleaning (WP 0083, Item 3)

Personnel Required
Equipment Repairer/Mechanic

References
TM 3-4230-238-10

Equipment Condition
Applicator module set on level ground
Engine off and cool
Ensure system pressure is relieved
High-pressure hose removed

REMOVAL

1. Remove bolt, nut, and washers (Figure 1, Item 1) from high-pressure outlet retaining mount (Figure 1, Item 2).
2. Remove high-pressure outlet (Figure 1, Item 3) from flow heater bottom.
3. Loosen and slide back thermostat sensor retaining nut (Figure 1, Item 5).

NOTE

Water may leak from high pressure outlet after removal of thermostat sensor.

4. Remove thermostat sensor (Figure 1, Item 4) from high-pressure outlet (Figure 1, Item 3).

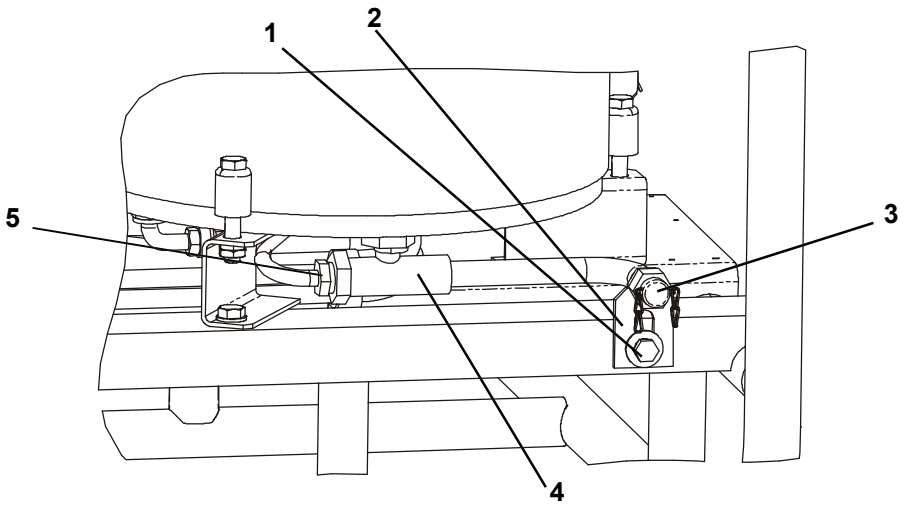


Figure 1. High-Pressure Outlet - Removal.

END OF TASK

INSTALLATION

NOTE

Ensure there is no debris around and inside o˜ ow heater bottom high-pressure outlet ÿtting.

1. Insert thermostat sensor (Figure 2, Item 4) into high-pressure outlet (Figure 2, Item 3) and secure with retaining nut (Figure 2, Item 5) and tighten.

2. Align and install high-pressure outlet onto ¸ ow heater bottom.

   a. Do not tighten high-pressure outlet (Figure 2, Item 3) at this time.

   b. Align and install bolt, washers, and nut (Figure 1, Item 1). to high-pressure outlet's retaining mount (Figure 2, Item 2).

   c. Tighten high-pressure outlet (Figure 2, Item 3) at ¸ ow heater bottom with appropriate wrench. Do not over tighten high-pressure outlet.

   d. Tighten high-pressure outlet's retaining mount nut and bolt (Figure 2, Item 1).

3. Operate applicator module in 120 °F and 175 °F modes of operation (Operator's Manual, WP 0008).

4. Check high-pressure outlet and thermostat sensor connections for leaks.

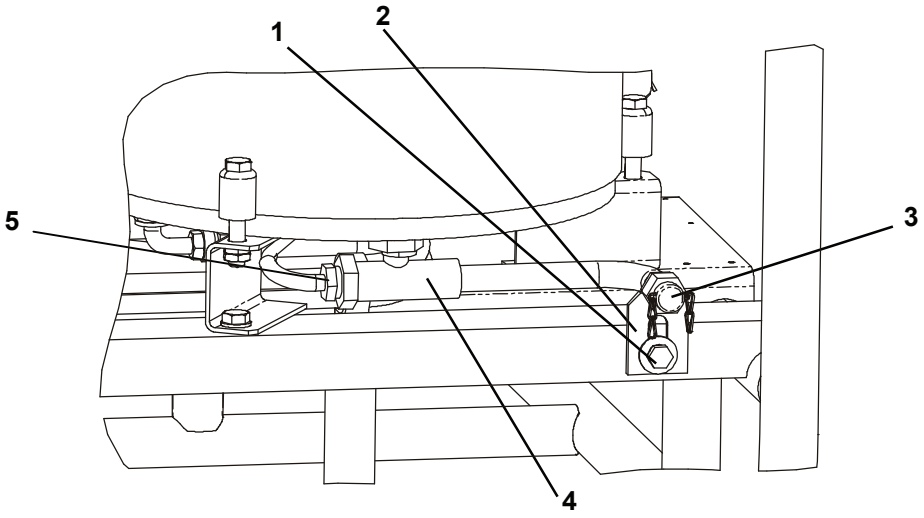


Figure 2. High Pressure Outlet - Installation.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
CALCIUM INHIBITOR INJECTION SCREEN CLEANING/REPLACEMENT

INITIAL SETUP:

Test Equipment
Not Applicable

Tools
Tool Kit, General Mechanic (WP 0082, Item 2)

Materials/Parts
Restrictor Fluid (WP 0072, Item 17)
Tubing, Nonmetalic (WP 0072, Item 15)

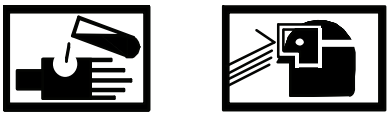
Personnel Required
Equipment Repairer/Mechanic

References
Not Applicable

Equipment Condition
Engine off and cool

REMOVAL

WARNING



CHEMICAL **EYE PROTECTION**

When working with a calcium inhibitor, wear protective clothing, protective rubber gloves, and chemical splash goggles. This product is mildly hazardous and has minimal negative effects on the human body. Use only with adequate ventilation.

1. Loosen hose clamps (Figure 1, Item 1).
2. Remove metering hose (Figure 1, Item 2).
3. Remove hose clamps (Figure 1, Item 1) from both ends of metering hose (Figure 1, Item 2).
4. Check hose for damage.

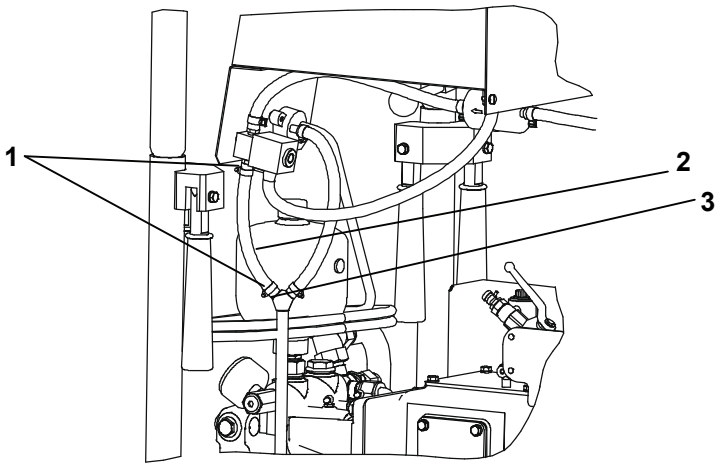


Figure 1. Calcium Inhibitor Injection Screen Assembly - Removal.

REMOVAL - CONTINUED

5. Using small screw driver, run it through top of metering hose (Figure 1, Item 2) to push calcium inhibitor screen (Figure 1, Item 3) out other end of metering hose (Figure 1, Item 2).
6. Clean injection screen by blowing air through metering hole located in center of screen.
7. Discard old calcium inhibitor injection screen if damaged.
8. Discard hose if damaged.

END OF TASK

INSTALLATION

1. Insert injection screen into “Y” fitting (Figure 2, Item 4) where injection screen was removed.
2. Connect lower end of metering hose (Figure 2, Item 3).
3. Install two hose clamps (Figure 2, Item 1).
4. Connect upper end of metering hose (Figure 2, Item 3) to metering valve (Figure 2, Item 2).
5. Tighten two hose clamps (Figure 2, Item 1).

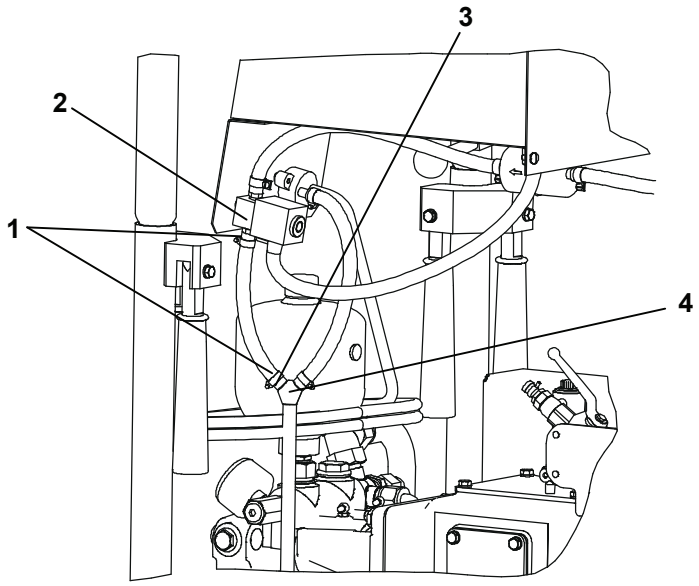


Figure 2. Calcium Inhibitor Injection Screen Assembly - Installation.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
METERING VALVE REPLACEMENT

INITIAL SETUP:

Test Equipment
Not Applicable

Tools
Tool Kit, General Mechanic (WP 0082, Item 2)

Materials/Parts
Valve, Safety Relief (WP 0072, Item 22)

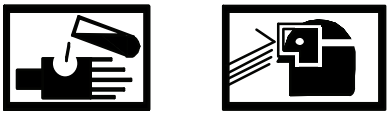
Personnel Required
Equipment Repairer/Mechanic

References
Not Applicable

Equipment Condition
Applicator module set on level ground
Engine off and cool

REMOVAL

WARNING



CHEMICAL EYE PROTECTION

When working with a calcium inhibitor, wear protective clothing, protective rubber gloves, and chemical splash goggles. This product is very mildly hazardous and has minimal negative effects on the human body. Use only with adequate ventilation.

NOTE

Ensure hoses are mounted correctly. Facing the control panel, hose mounted to left side of metering valve is the inlet hose from the chemical or soap source. The right hose is for discharge into water pump assembly.

1. Loosen inlet and outlet hose clamps (Figure 1, Items 1 and 2) located on back side of metering valve and slide clamps down onto hose.

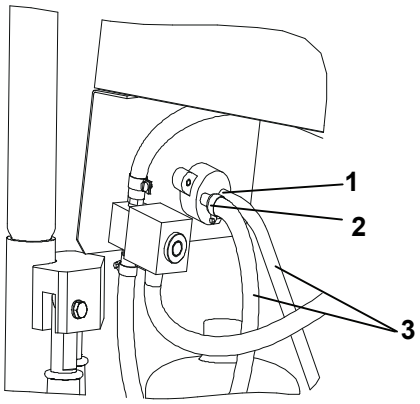


Figure 1. Metering Valve Rear View - Removal.

REMOVAL - CONTINUED

2. Remove two hoses (Figure 1, Item 3) from reverse side of metering valve. The hoses are attached to ribbed fitting.
3. Remove round disk (Figure 2, Item 2) from center of selector knob (Figure 2, Item 1).
4. Loosen retaining screw that retains selector knob on metering valve screw.
5. Remove selector knob (Figure 2, Item 1). Note position of selector knob for replacing metering valve.
6. Loosen and remove two screws (Figure 2, Item 4) that retain metering valve to mounting plate (Figure 2, Item 3).
7. Remove metering valve.

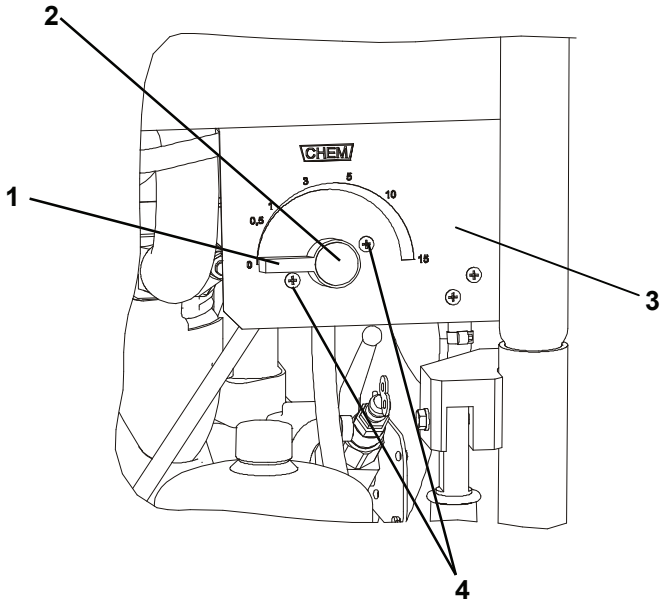


Figure 2. Metering Valve Front View.

END OF TASK

INSTALLATION

1. Insert metering valve into mounting plate (Figure 2, Item 3), ensuring spring is retained on metering valve shaft.
2. Align valve so that metering valve shaft protrudes through hole in mounting plate (Figure 2, Item 3).
3. Align and insert two screws (Figure 2, Item 4) securing metering valve to mounting plate. Tighten screws.
4. Install selector knob (Figure 2, Item 1) onto metering valve.
5. Orient knob so that when it is positioned at 0 (zero) mark it is in off position.
6. Secure selector knob with screw.
7. Install round disk protecting screw (Figure 2, Item 2).

INSTALLATION - CONTINUED

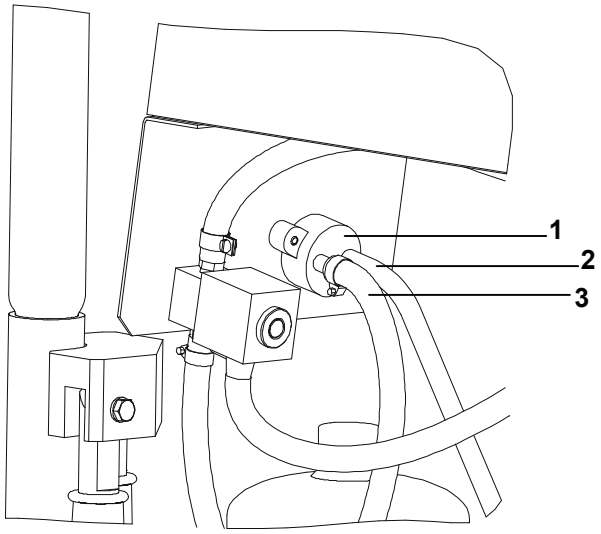


Figure 3. Metering Valve Rear View - Installation.

8. Attach inlet hose (Figure 3, Item 2), mounted to left side of metering valve (facing control panel), and outlet hose (Figure 3, Item 3) mounted to right side, to metering valve (Figure 3, Item 1).
9. Secure hoses with hose clamps.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
ENGINE FUEL SUPPLY LINE REPLACEMENT

INITIAL SETUP:

Test Equipment
Not Applicable

Tools
Tool Kit, General Mechanic (WP 0082, Item 2)

Materials/Parts
Fuel Pipe, (WP 0075, Item 23)
Clamp, Hose (2)(WP 0075, Item 4)
Cloth, Cleaning (WP 0083, Item 3)
Pan, Drain (WP 0083, Item 8)

Personnel Required
Equipment Repairer/Mechanic

References
TM 3-4230-238-10
WP 0055

Equipment Condition
Engine off and cool

REMOVAL

WARNING

Fuel is highly flammable and will cause serious injuries or death. Never smoke or have open flames within 50 feet of the applicator module. Avoid fuel spills. Wear protective clothing, protective rubber gloves and chemical splash goggles.

NOTE

Catch all residual fuel in drain pan.

1. Remove hose clamps (Figure 1, Item 1) from fuel filter (Figure 1, Item 2).
2. Remove hose clamp (Figure 2, Item 1) from fuel pump (Figure 2, Item 2). (Discard any non adjustable clamps).

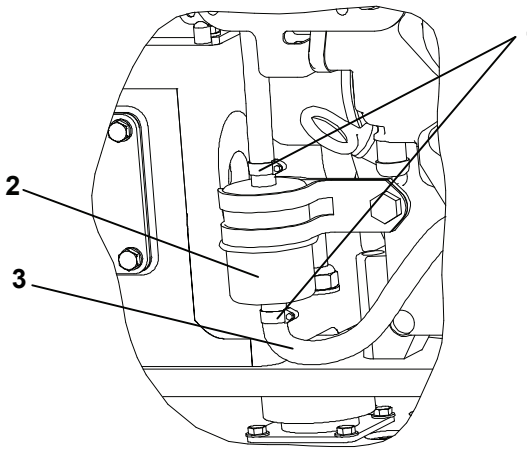


Figure 1. Fuel Filter Assembly – Removal.

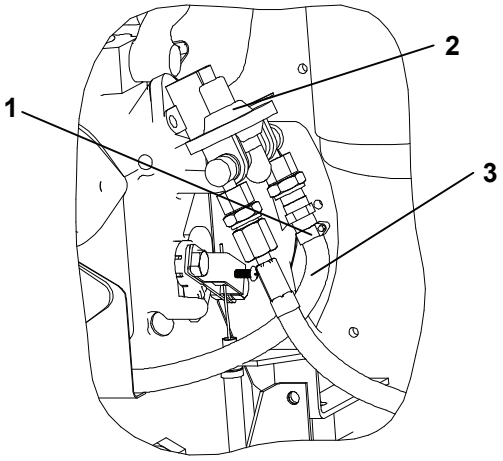


Figure 2. Fuel Pump Assembly – Removal

REMOVAL - CONTINUED

3. Remove hose clamp (Figure 3, Item 1) from emergency fuel shutoff valve (Figure 3, Item 2).
4. Remove fuel lines (Figure 1, Item 3) from fuel filter (Figure 1, Item 2).
5. Remove fuel line (Figure 2, Item 3) from fuel pump (Figure 2, Item 2).
6. Remove fuel line (Figure 3, Item 3) from emergency fuel shutoff valve (Figure 3, Item 2).

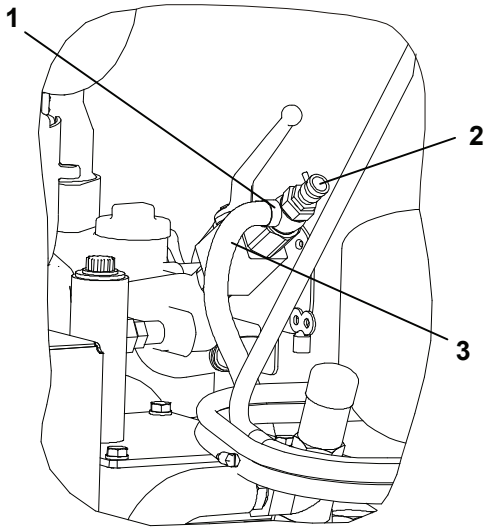


Figure 3. Emergency Fuel Shutoff Valve.

END OF TASK

INSTALLATION

1. Replace hose clamp (Figure 3, Item 1) and fuel line (Figure 3, Item 3) to emergency fuel shutoff valve (Figure 3, Item 2). Tighten hose clamps.
2. Replace hose clamp (Figure 4, Item 1) and fuel line (Figure 4, Item 3) to fuel pump (Figure 4, Item 2). Tighten hose clamps.
3. Replace two hose clamps (Figure 5, Item 1) and fuel lines (Figure 5, Item 3) to fuel filter (Figure 5, Item 2). Tighten hose clamps.

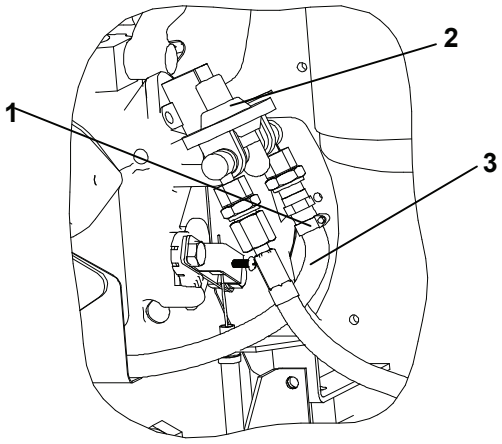


Figure 4. Fuel Pump Assembly - Installation.

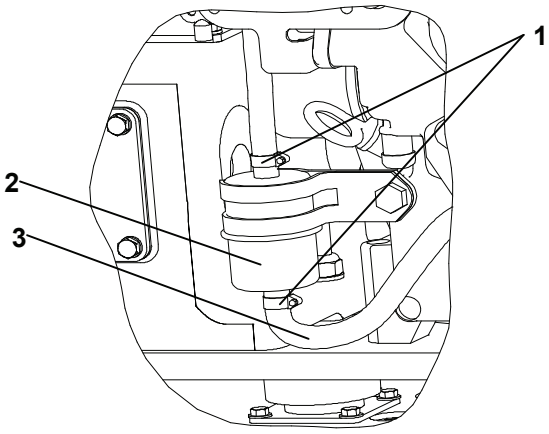


Figure 5. Fuel Filter Assembly - Installation.

INSTALLATION - CONTINUED

4. Bleed fuel system (WP 0055).
5. Start engine (Operator's Manual, WP 0007) and check for fuel leaks.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
LOW FUEL SENSOR REPLACEMENT

INITIAL SETUP:

Test Equipment
Not Applicable

Tools
Tool Kit, General Mechanic (WP 00082, Item 2)

Materials/Parts
Switch, Liquid Level (WP 0073, Item 8)
Cotter Pin (WP 0073, Item 9)
Cloth, Cleaning (WP 0083, Item 3)
Strap, Tiedown electrical (WP 0083, Item 11)
Empty Fuel Can

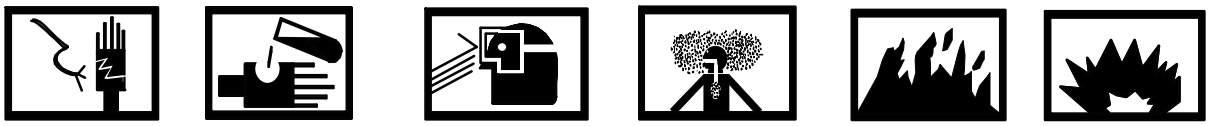
Personnel Required
Equipment Repairer/Mechanic

References
Not Applicable

Equipment Condition
Applicator module set on level ground
Engine off and cool

REMOVAL

WARNING



ELECTRICAL CHEMICAL EYE PROTECTION VAPOR FIRE EXPLOSION

Always disconnect battery cables before performing maintenance to prevent electrical shock which could cause injury or death. Always wear eye protection and protective gloves when handling the battery.

Fuel is highly flammable and will cause serious injuries or death. Never smoke or have open flames within 50 feet of the applicator module. Avoid fuel spills. Wear protective clothing, protective rubber gloves and chemical splash goggles.

1. Disconnect applicator module battery.
   a. Unclip negative terminal protective cover.
   b. Remove negative terminal connector from battery.
2. Remove fuel suction tube from fuel suction tube holder.
3. Remove cable tie and slide protective sleeve up to expose set screw.
4. Loosen, **but do not remove**, setscrew (Figure 1, Item 1) located at top of fuel level indicator tube assembly that retains fuel level sensor wiring.

REMOVAL - CONTINUED

5. Slide fuel level indicator tube through mounting hole 3-4 inches on fuel can cap, but not all the way out of cap assembly and ensure it is out of bottom mount (Figure 2, Item 1).

6. Remove cotter pin (Figure 2, Item 2) and discard.

NOTE

Observing the top of the float indicator is important for correct installation and proper function.

7. Slide fuel level float off of indicator tube assembly. Note orientation of float indicator.

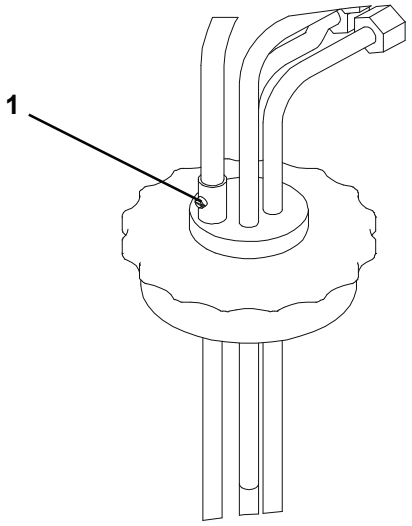


Figure 1. Fuel Can Cap Assembly.

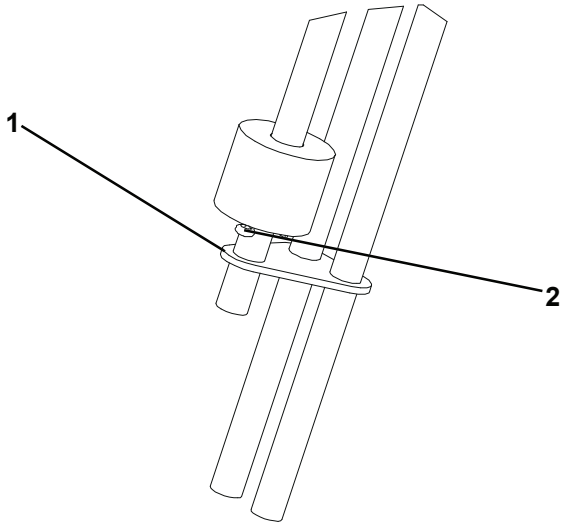


Figure 2. Fuel Level Indicator Tube.

END OF TASK

INSTALLATION

1. Slide fuel level float onto fuel level indicator tube assembly ensuring top of indicator is installed correctly (see Removal, step 3).
2. Insert lower end of fuel level tube assembly into lower mount and insert replacement cotter pin (Figure 2, Item 2) into retaining hole, ensuring that wiring located at top of fuel cap is able to move freely after fuel level tube assembly is inserted.
3. Tighten setscrew, slide protective sleeve down and install cable tie.
4. Install fuel can cap assembly into **empty** fuel can.

INSTALLATION - CONTINUED

5. Reconnect the applicator module battery.
   a. Attach negative terminal connector.
   b. Close terminal protective cover.
6. Set selector switch to engine start position.
   a. The yellow indicator light should come on indicating low fuel level.
   b. If light does not come on, float is installed upside down; reinstall.
7. Turn selector switch to off position.
8. Remove fuel suction tube from empty fuel can and insert into fuel can that is at least half full.
9. Turn selector switch to start position. The yellow indicator light should not be illuminated.
10. Turn selector switch to off position.
11. Remove fuel suction tube from fuel can and install it into fuel suction tube holder.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
FLOW HEATER MAINTENANCE

INITIAL SETUP:

Test Equipment
Not Applicable

Personnel Required
Equipment Repairer/Mechanic (2)

Tools
Tool Kit, General Mechanic (WP 0082, Item 2)
Bit, star-head (WP 0082, Item 3)

References
WP 0022

Materials/Parts
Packing Material (WP 0074, Item 10)
Washer, Lock (3) (WP0074, Item 5)
Cloth, Cleaning (WP 0083, Item 3)

Equipment Condition
Applicator module set on level ground
Engine off and cool

CLEANING THE FLOW HEATER

WARNING

CHEMICAL EYE PROTECTION VAPOR FIRE EXPLOSION

Fuel is highly flammable and will cause serious injuries or death. Never smoke or have open flames within 50 feet of the applicator module. Avoid fuel spills. Wear protective clothing, protective rubber gloves and chemical splash goggles.

1. Disconnect exhaust pipe at heater.
   a. Remove screw (Figure 1, Item 2), flat and lock washers, and nut securing pipe to flow heater.
   b. Move exhaust pipe (Figure 1, Item 1) away from flow heater exhaust outlet (Figure 1, Item 3).

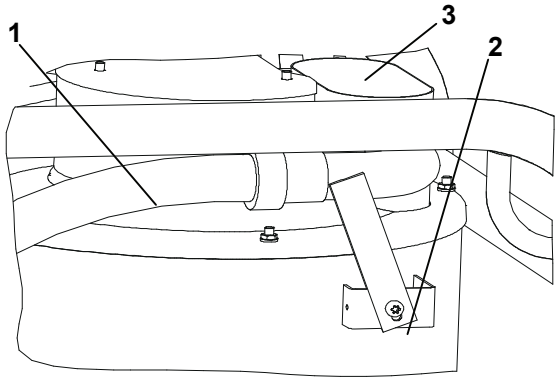


Figure 1. Exhaust Pipe Support.

CLEANING THE FLOW HEATER - CONTINUED

2. Remove top cover and igniter plugs and disconnect burner nozzle fuel line.

   a. Loosen and remove three acorn nuts and lock washers (Figure 2, Item 1) securing burner unit top cover (Figure 2, Item 2) and remove cover.

   b. Remove igniter plugs (Figure 3, Item 1) from igniter electrodes.

   c. Remove fuel line (Figure 3, Item 2) from nozzle (Figure 3, Item 3), catching residual fuel in cleaning cloth.

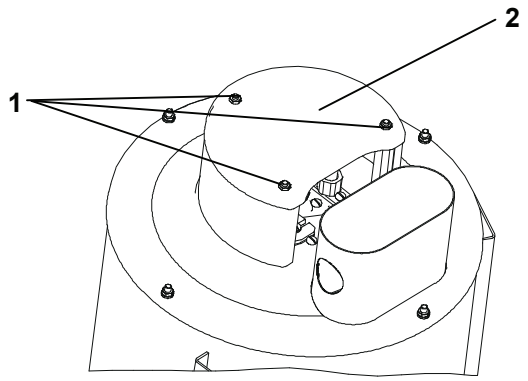


Figure 2. Burner Top Cover.

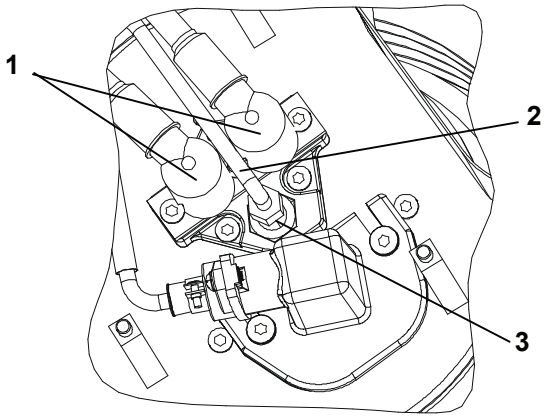


Figure 3. Burner Nozzle Assembly - Cleaning.

3. Remove fuel suction tube holder (Figure 5, Item 1).

4. Remove burner unit cloth collar (WP 0022).

5. Remove fuel line burner retaining clamp from outer casing (Figure 5, Item 2).

6. Remove four acorn nuts and lock washers (Figure 6, Item 2) and remove top cover (Figure 6, Item 1).

WARNING

There is a pinching hazard associated with removal of flow heater.

NOTE

One of the nuts can only be accessed from the right side of the safety system.

7. Remove six retaining nuts and washers (Figure 6, Item 3) securing burner assembly (Figure 6, Item 4) and remove burner assembly (Figure 6, Item 4).

CLEANING THE FLOW HEATER - CONTINUED

8. Remove three retaining bolts and six nuts (Figure 4, Item1) between heater bottom and outer casing (Figure 4, Item 2).

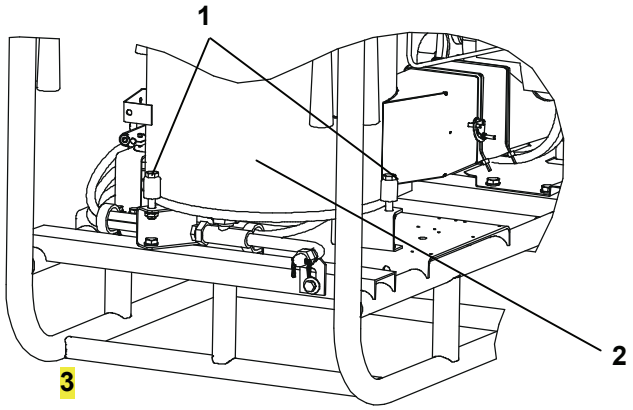


Figure 4. Flow Heater Outer Casing

9. Lift outer casing (Figure 6, Item 5) upward.
10. Clean burner assembly (Figure 6, Item 4) and heating coils (Figure 6, Item 8) with cleaning cloth.
11. Clean top cover (Figure 6, Item 1) and outer casing (Figure 6, Item 5) with cleaning cloth.
12. Check sealing cord (Figure 6, Item 7) between bottom and outer casing for damage. Replace if damaged.
13. Remove excess water from bottom (Figure 6, Item 6) of flow heater with cleaning cloths.

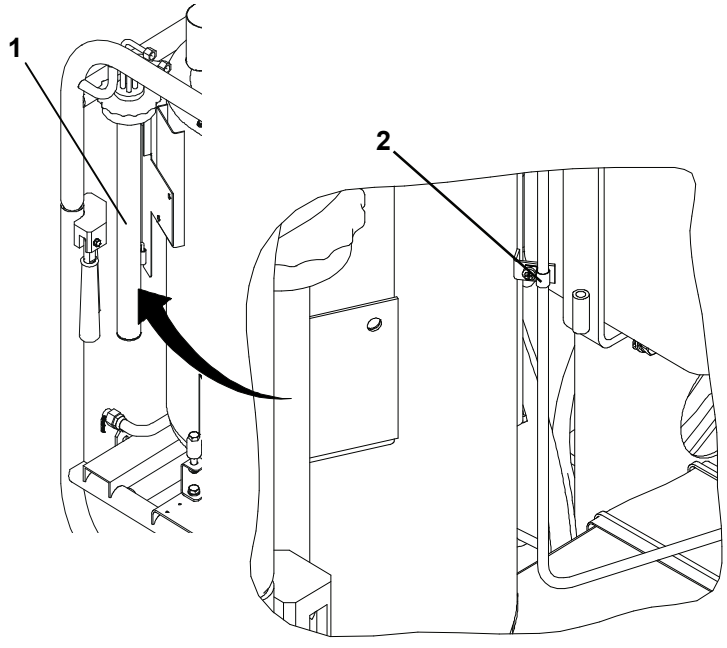


Figure 5. Heating Coil Sleeve.

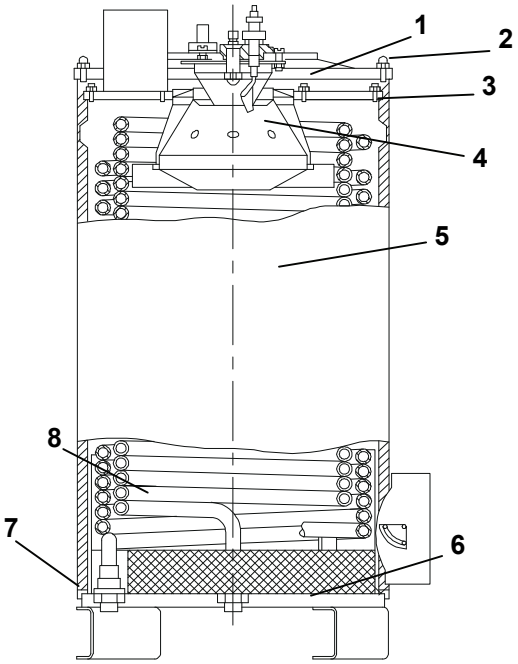


Figure 6. Flow Heater Assembly.

END OF TASK

INSTALLATION

WARNING

There is a pinching hazard associated with installation of burner assembly.

1. Install outer casing (Figure 6, Item 5) to heater bottom (Figure 6, Item 6).
2. Observe positioning of casing to align three casing retaining mounts (Figure 4, Item 1) and ensure sealing cord (Figure 6, Item 7) is not exposed.

NOTE

One of the nuts can only be accessed from the right side of the safety system.

3. Install three casing retaining bolts and nuts (Figure 4, Item 1) and tighten them evenly around outer casing (Figure 4, Item 2).
4. Install burner assembly (Figure 6, Item 4) and secure with six washers and nuts (Figure 6, Item 3).
5. Install burner cover (Figure 6, Item 1) and secure with three acorn nuts and new lock washers (Figure 6, Item 2).
6. Install cloth collar (WP 0022).
7. Install top cover, igniter plugs, and burner fuel line.
   a. Reinstall fuel line (Figure 7, Item 2) to nozzle holder (Figure 7, Item 3) and tighten.
   b. Reinstall igniter cables (Figure 7, Item 1) to igniters. Ensure that cables are seated onto igniters.
   c. Reinstall burner unit top cover (Figure 2, Item 2).
8. Attach burner fuel line (Figure 5, Item 2) to outer casing using retaining clamp.
9. Connect engine exhaust pipe to burner exhaust.
   a. Install exhaust pipe (Figure 1, Item 1) to burner outlet
   b. Secure pipe mount with screw (Figure 1, Item 2), flat and new lock washers and nut.
10. Install fuel suction tube holder (Figure 5, Item 1).

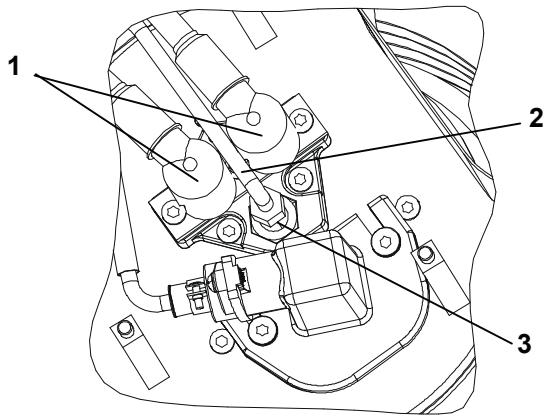


Figure 7. Burner Nozzle Assembly - Installation

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
FLOW HEATER DECALCIFYING MAINTENANCE

INITIAL SETUP:

Test Equipment
Not Applicable

Personnel Required
Equipment Repairer/Mechanic

Tools
Tool Kit, General Mechanic (WP 0082, Item 2)

References
TM 3-4230-238-10

Materials/Parts
55 Gallon Container (2)
Decalcifying solution (CLR) (WP 0083, Item 4)
Accessory Kit (WP 0082, Item 1)

Equipment Condition
Applicator module set on level ground
Prepare for water operations (Operator's Manual, WP 0006)

DECALCIFYING

WARNING

CHEMICAL EYE PROTECTION FIRE VAPOR

During decalcifying, combustible gases are released. Do not smoke while decalcifying the system. Provide for adequate ventilation. Wear protective clothing, protective rubber gloves and chemical splash goggles.

1. Mix decalcifying solution in accordance with manufacturer's mixing instructions into one 55 gallon container. Container should not be more than half full.
2. Insert suction hose with filter suction basket into 55 gallon container containing decalcifying solution.
3. Remove hand spray gun from high-pressure hose. Insert high-pressure hose into decalcifying solution.
4. Start applicator module (Operator's Manual, WP 0007).
5. Set selector switch to pump position (Operator's Manual, WP 0008). Run system for 3 to 5 minutes.
6. Shut down applicator module (Operator's Manual, WP 0013). Wait 10 minutes.
7. Start applicator module (Operator's Manual, WP 0007).

DECALCIFYING - CONTINUED

WARNING

At high water temperatures, the decalcifying solution can produce dangerous gases and vapors. Heat the decalcifying solution to a maximum of 120 °F/50 °C. Ensure that no steam bubbles rise up. If necessary, set the selector switch back to the pump position from time to time to switch off the burner.

8. Set selector switch to 120 °F/50 °C (Operator's Manual, WP 0008). Run system for 3 to 5 minutes.
9. Shut down applicator module (Operator's Manual, WP 0013). Wait 10 minutes.
10. Remove suction hose with filter suction basket from 55 gallon container containing decalcifying solution.
11. Insert suction hose with suction filter basket into a full 55 gallon container containing clean water.
12. Start applicator module (Operator's Manual, WP 0007).
13. Set selector switch to pump position (Operator's Manual, WP 0008).
14. Run applicator module for 1 to 2 minutes until decalcifying solution is removed from system.
15. Set selector switch to engine position and set throttle lever to idle position (Operator's Manual, WP 0007).
16. Remove high-pressure hose from decalcifying solution container and insert high-pressure hose into clean water container.
17. Set selector switch to pump position (Operator's Manual, WP 0008) and move throttle lever to half throttle position.
18. Run applicator module for at least 5 minutes.
19. Shut down applicator module (Operator's Manual, WP 0013).
20. Dispose of decalcifying solution in accordance with local operating procedures.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
IGNITER ELECTRODE ADJUSTMENT AND REPLACEMENT

INITIAL SETUP:

Test Equipment
Not Applicable

Tools
Tool Kit, General Mechanic (WP 0082, Item 2)

Materials/Parts
Electrode (WP 0074, Item 11)
Washer, Lock (3) (WP 0074, Item 5)
Cloth, Cleaning (WP 0083, Item 3)

Personnel Required
Equipment Repairer/Mechanic

Reference
Not Applicable

Equipment Condition
Applicator module set on level ground
Engine off and cool

REMOVAL

WARNING

CHEMICAL **EYE PROTECTION** **VAPOR** **FIRE** **EXPLOSION**

Fuel is highly flammable and will cause serious injuries or death. Never smoke or have open flames within 50 feet of the applicator module. Avoid fuel spills. Wear protective clothing, protective rubber gloves and chemical splash goggles.

1. Remove burner top cover (Figure 1, Item 2) by removing three acorn nuts and lock washers (Figure 1, Item 1).

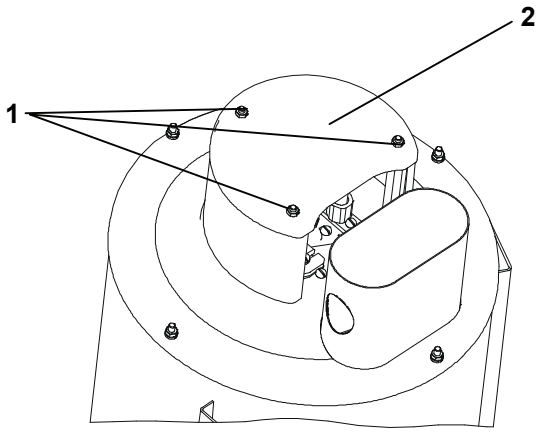


Figure 1. Burner Top Cover.

REMOVAL - CONTINUED

2. Pull igniter plugs (Figure 2, Item 1) from igniter electrodes (Figure 3, Item 5).

3. Loosen and remove fuel line from nozzle holder (Figure 3, Item 1). Catch residual fuel with cleaning cloth.

NOTE

Igniter electrodes are located in igniter electrode holder.

NOTE

The screw not visible in the illustration is located under fuel nozzle fuel line.

4. Remove igniter electrode holder (Figure 3, Item 2) by removing three screws (Figure 3, Item 3). The location of three screws resembles a triangle.

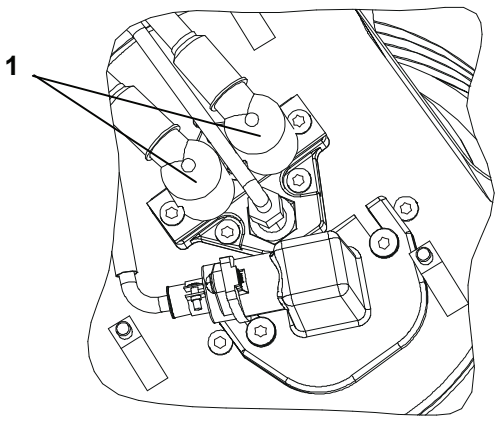


Figure 2. Igniter Holder – Igniter Plugs .

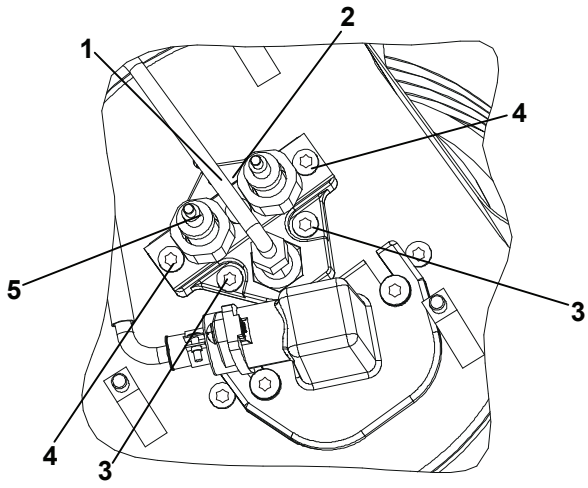


Figure 3. Igniter Holder – Without Igniter Plugs .

END OF TASK

ADJUSTMENT OF THE IGNITER ELECTRODES

1. Complete removal task.
2. Clean igniter electrodes using cleaning cloth. Inspect igniter electrodes, replace if damaged.

NOTE

The screw not visible in the illustration is located under fuel nozzle fuel line.

3. Loosen, **but do not remove**, three igniter electrode retaining screws (Figure 3, Item 4) in electrode holder (Figure 3, Item 2) so that it can just still be rotated.
4. Align electrode tips with respect to each other and to nozzle hole as shown (Figure 4, Item 1).
5. If necessary, carefully bend electrode tips with flat pliers. Gap adjustment (Figure 4, Item 2) is 1/8 inch.
6. Tighten igniter electrode holder's three retaining screws (Figure 3, Item 4).
7. Check adjustment and correct if necessary. Gap should be 1/8 inch distance between electrode tips.

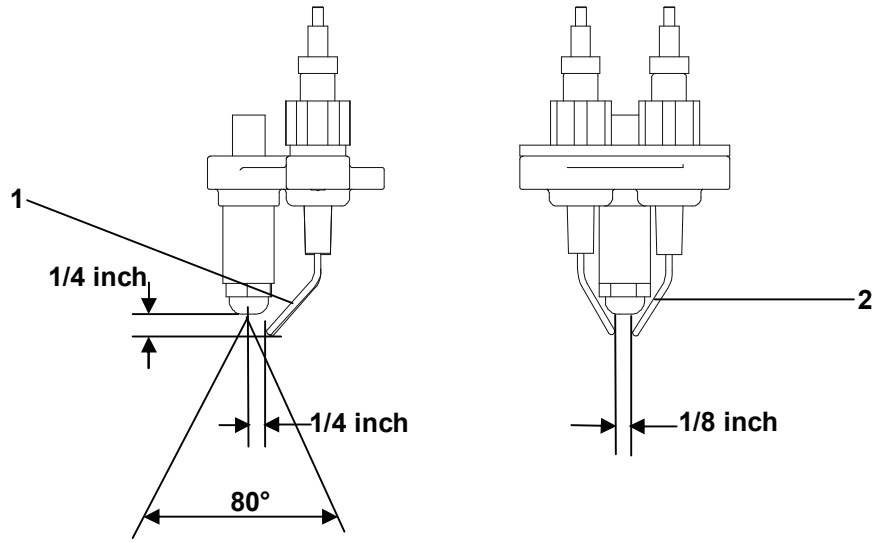


Figure 4. Ignition Electrodes Assembly.

END OF TASK

INSTALLATION

1. Reinsert and align igniter holder into burner top assembly. It can be only installed one way.
2. Secure with three screws (Figure 5, Item 2).
3. Reinstall and tighten burner fuel line (Figure 5, Item 1).
4. Reinstall igniter plugs to igniters (Figure 6, Item 1).
5. Reinstall burner top cover (Figure 1, Item 2) and secure with three acorn nuts and new lock washers (Figure 1, Item 1).

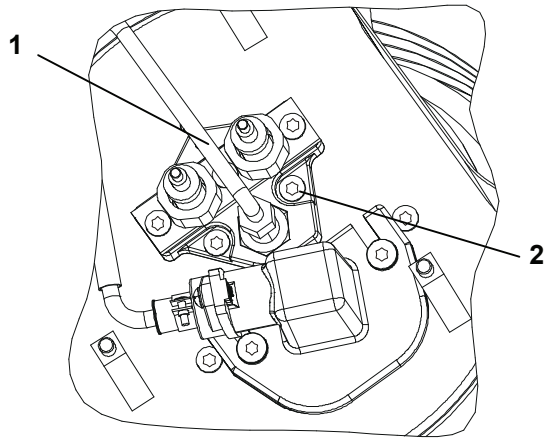


Figure 5. Igniter Holder- Install

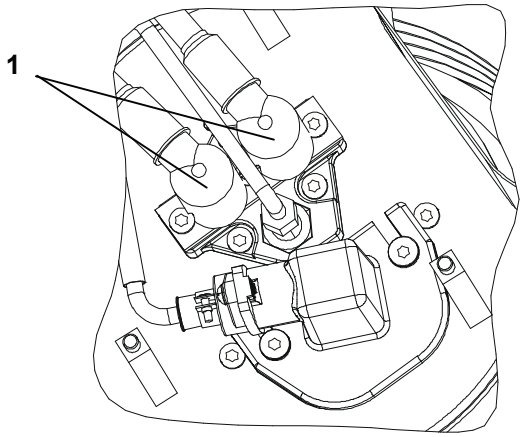


Figure 6. Igniter Holder – Install with Igniter Plugs.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
BURNER NOZZLE CLEANING AND REPLACEMENT

INITIAL SETUP:

Test Equipment
Not Applicable

Personnel Required
Equipment Repairer/Mechanic

Tools
Tool Kit, General Mechanic (WP 0082, Item 2)
Bit, star-head (WP 0082, Item 3)

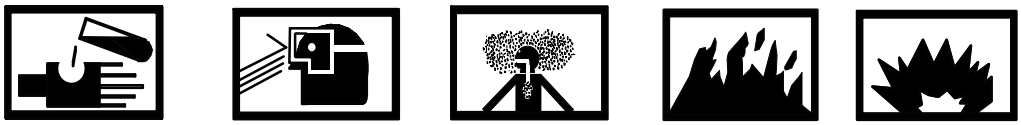
References
Not Applicable

Materials/Parts
Nozzle, Oil Burner (WP 0074, Item 9)
Washer, Lock (3) (WP 0074, Item 5)
Accessory Kit (WP 0082, Item 1)
Cloth, Cleaning (WP 0083, Item 3)

Equipment Condition
Applicator module set on level ground
Engine off and cool

REMOVAL

WARNING



CHEMICAL EYE PROTECTION VAPOR FIRE EXPLOSION

Fuel is highly flammable and will cause serious injuries or death. Never smoke or have open flames within 50 feet of the applicator module. Avoid fuel spills. Wear protective clothing, protective rubber gloves and chemical splash goggles.

1. Loosen and remove three acorn nuts and lock washers (Figure 1, Item 1) securing burner unit top cover (Figure 1, Item 2) and remove cover.

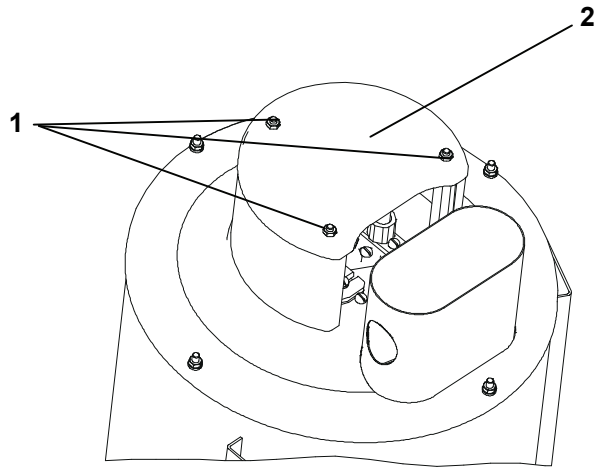


Figure 1. Burner Top Cover.

REMOVAL - CONTINUED

2. Remove igniter plugs (Figure 2, Item 1) from igniter electrodes.

3. Loosen two screws (Figure 2, Item 5) holding photoelectric eye holder (Figure 2, Item 6).

4. Slide photoelectric eye holder (Figure 2, Item 6) back enough to gain access to retaining hex screw (Figure 2, Item 4).

5. Remove fuel line (Figure 2, Item 2) from fuel nozzle (Figure 2, Item 3). Catch residual fuel in cleaning cloth.

6. Loosen retaining hex screw (Figure 2, Item 4) and pull up on fuel nozzle (Figure 2, Item 3). It may take upward force to remove nozzle.

7. Remove fuel nozzle (Figure 2, Item 3) from nozzle holder (Figure 2, Item 7).

END OF TASK

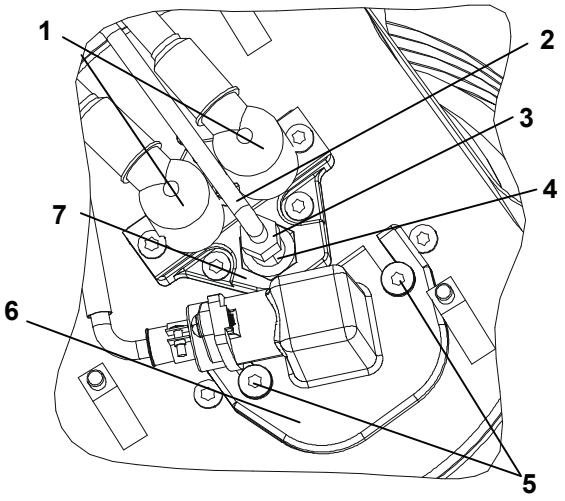


Figure 2. Burner Nozzle Assembly

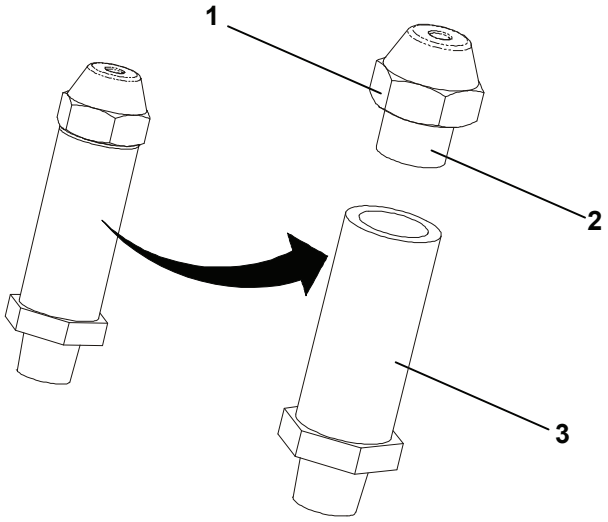


Figure 3. Fuel Nozzle.

CLEAN/REPLACE

1. Complete REMOVAL task.

2. Loosen and remove fuel nozzle tip (Figure 3, Item 1) from fuel nozzle body (Figure 3, Item 3).

3. Clean nozzle fuel screen (Figure 3, Item 2), located in the fuel nozzle tip (Figure 3, Item 1), using cleaning cloth. Replace fuel nozzle if fuel nozzle screen can not be cleaned or is damaged.

4. Reassemble fuel nozzle.

END OF TASK

INSTALLATION

1. Reinsert fuel nozzle (Figure 2, Item 3) into nozzle holder (Figure 2, Item 7). Ensure that nozzle holder sits flush with burner assembly.

2. Secure nozzle with retaining screw (Figure 2, Item 4).

3. Reinstall fuel line (Figure 2, Item 2) to nozzle holder (Figure 2, Item 7) and tighten.

4. Position photoelectric eye holder (Figure 2, Item 6) in towards fuel nozzle holder (Figure 2, Item 7). Tighten screws (Figure 2, Item 5).

5. Reinstall burner igniter cables to igniters (Figure 2, Item 1). Ensure that cables are seated onto igniters.

6. Reinstall burner unit top cover (Figure 1, Item 2).

7. Secure cover with three new lock washers and acorn nuts (Figure 1, Item 1).

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
BURNER PHOTO CELL CLEANING/INSPECTION AND REPLACEMENT

INITIAL SETUP:

Test Equipment
Not Applicable

Tools
Tool Kit, General Mechanic (WP 0082, Item 2)

Materials/Parts
Glass, Liquid Sight (WP 0074, Item 17)
Photometer, Flame (WP 0074, Item 15)
Washer, Lock (3) (WP 0074, Item 5)
Accessory Kit (WP 0082, Item 1)
Cloth, Cleaning (WP 0083, Item 3)

Personnel Required
Equipment Repairer/Mechanic (2)

References
TM 3-4230-230-10

Equipment Condition
Applicator module set on level ground
Engine off and cool

CLEANING/INSPECTION/REMOVAL

1. Remove top cover (Figure 1, Item 1) on burner housing by removing the three acorn nuts and lock washers (Figure 1, Item 2).

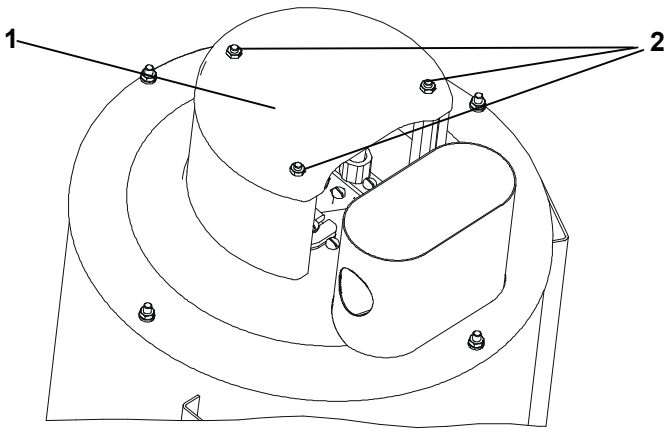


Figure 1. Burner Top Cover.

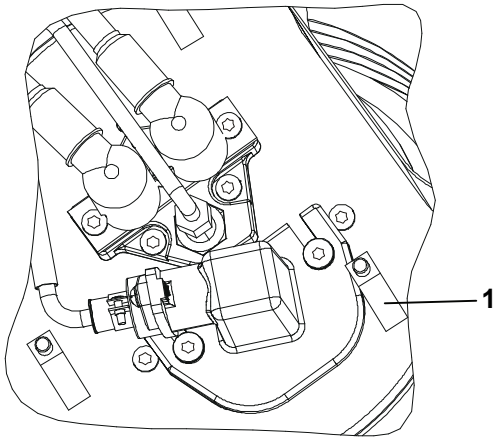


Figure 2. Burner Photo Cell Assembly - Cover Removed.

CLEANING/INSPECTION/REMOVAL - CONTINUED

2. Remove photo cell (Figure 3, Item 1) by sliding out of holding device. Check for damage and clean with cleaning cloth.
3. To remove photo cell holding device to gain access to sight glass in burner housing, loosen two screws (Figure 3, Item 3), **but do not remove**. Rotate post (Figure 2, Item 1) clockwise to allow for removal, if required.
4. Slide upper and lower holding devices (Figure 3, Item 4) from under two mounting screws (Figure 3, Item 3). Note position and number of spacing washers.

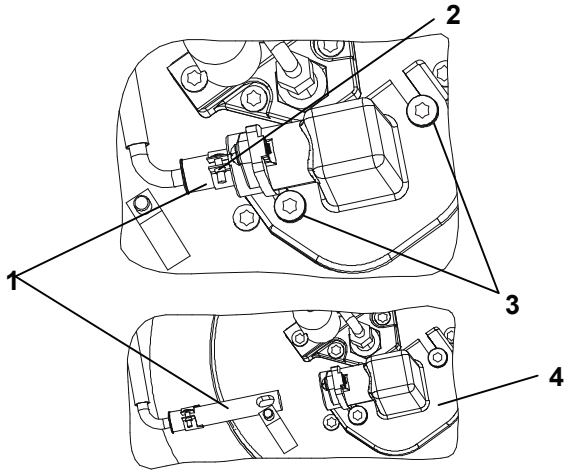


Figure 3. Burner Photo Cell Assembly Holding Device - Removal.

5. Start applicator module (Operator's Manual, WP 0007).
6. Set selector switch to 120°F/50°C position (Operator's Manual, WP 0008).
7. While one person operates the system, the other observes for igniter spark through burner sight glass (Figure 4, Item 1).
8. If no spark is visible:
   a. Shut down applicator module (Operator's Manual, WP 0013).
   b. Remove screw (Figure 4, Item 3) that retains sight glass holder (Figure 4, Item 2), sight glass (Figure 4, Item 1) and gasket.
   c. Clean sight glass (Figure 4, Item 1) and holder (Figure 4, Item 2) with soft cloth.
9. If sight glass is damaged or gasket is deteriorated, replace.

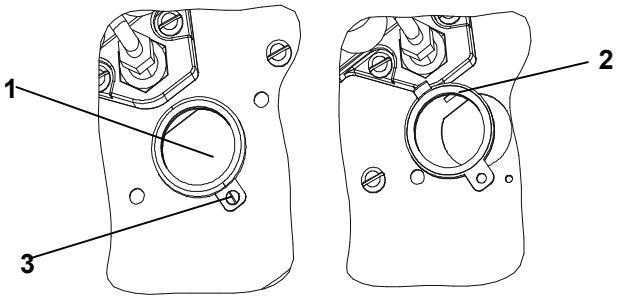


Figure 4. Sight Glass Assembly.

END OF TASK

INSTALLATION

1. Install new sight glass (Figure 4, Item 1) and gasket.
2. Install locating tab of sight glass (Figure 4, Item 1) and holder (Figure 4, Item 2) and secure with screw (Figure 4, Item 3) that was removed.
3. Install photo cell holder by sliding upper and lower holder devices (Figure 3, Item 4) under the two securing screws (Figure 3, Item 3). Position spacing washers as noted during removal.
4. Slide device all the way in channel and tighten two screws.
5. Install photo cell.
6. Ensure alignment lug located on photo cell slides into lug channel.
7. Insert photo cell all the way until band clip (Figure 5, Item 1) comes into contact with holding device.

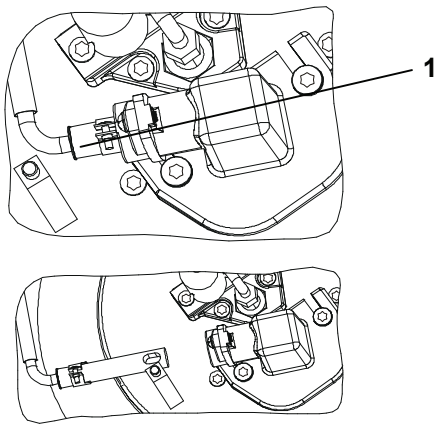


Figure 5. Burner Photo Cell Assembly Holding Device - Installation.

8. Reinstall top cover (Figure 6, Item 1) and secure with three acorn nuts and new lock washers (Figure 6, Item 2).

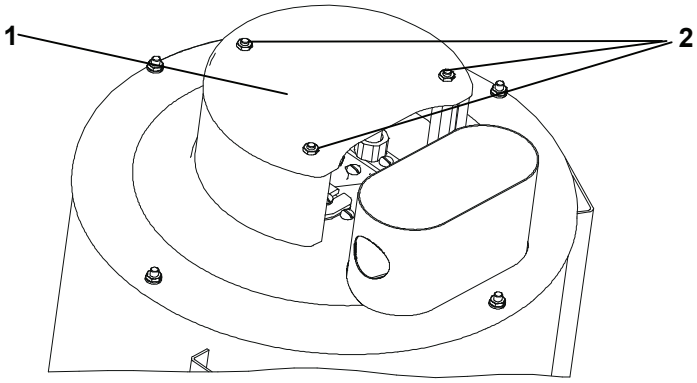


Figure 6. Burner Top Cover - Installation.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
BURNER FUEL LINE REPLACEMENT

INITIAL SETUP:

Test Equipment
Not Applicable

Tools
Tool Kit, General Mechanic (WP 082, Item 2)

Materials/Parts
Pipe Bent Metallic (WP 0073, Item 11)
Nut, Tube, Coupling (2) (WP 0073, Item 13)
Sleeve, Clinch Tube (2) (WP 0073, Item 12)
Washer, Lock (3) (WP 0074, Item 5)
Cloth, Cleaning (WP 0083, Item 3)
Strap, Tiedown electrical (WP 0083, Item 11)
Pan, Drain (WP 0083, Item 8)

Personnel Required
Equipment Repairer/Mechanic

References
TM 3-4230-238-10

Equipment Condition
Applicator module set on level ground
Engine off and cool

REMOVAL

WARNING

Always disconnect battery cables before performing maintenance to prevent electrical shock which could cause injury or death. Always wear eye protection and protective gloves when handling the battery.

Fuel is highly flammable and will cause serious injuries or death. Never smoke or have open flames within 50 feet (15 m) of the applicator module. Avoid fuel spills. Wear protective clothing, protective rubber gloves and chemical splash goggles.

1. Disconnect the applicator module battery.
   a. Unclip negative terminal protective cover.
   b. Remove negative terminal connector from battery.
2. Loosen three retaining screws (Figure 1, Item 1) on Blower cover and remove cover (Figure 1, Item 2).

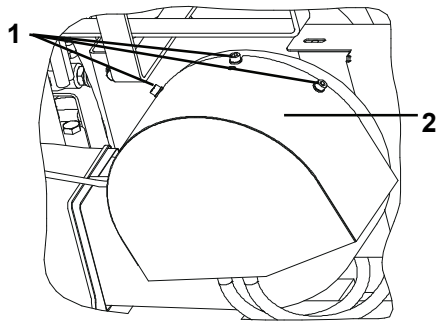


Figure 1. Blower Cover - Removal.

REMOVAL - CONTINUED

3. Remove three acorn nuts and lock washers (Figure 2, Item 1) from burner top cover (Figure 2, Item 2).
4. Cut and remove all cable ties that are secured to burner fuel line.
5. Disconnect and remove fuel line clamp (Figure 3, Item 1) on flow heater outer casing (Figure 3, Item 2). Retain fuel line clamp.
6. Place cleaning cloth under burner nozzle fuel line to catch residual fuel.

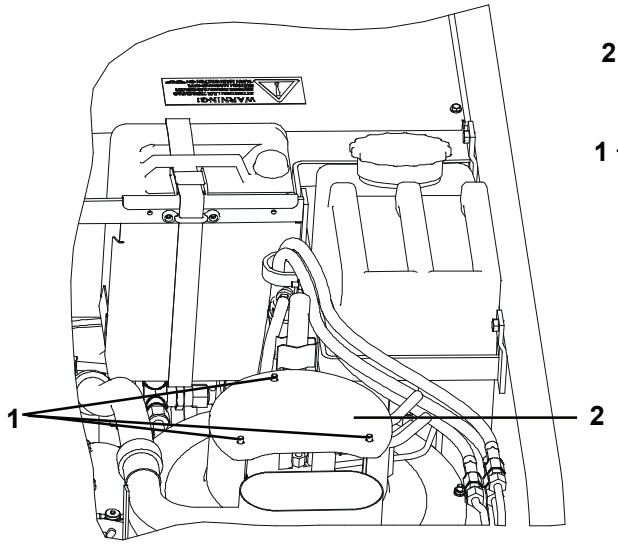


Figure 2. Burner Top Cover – Removal.

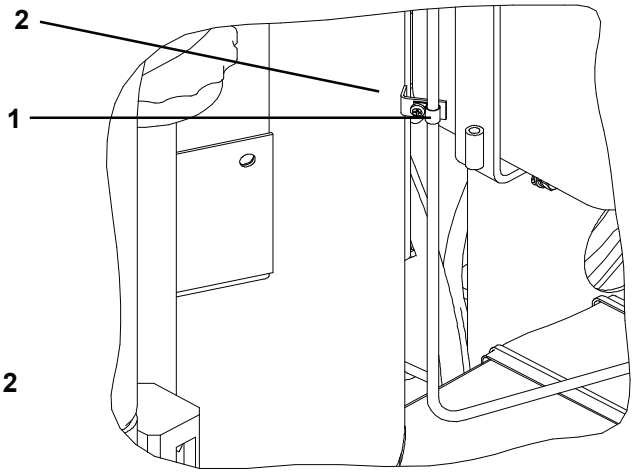


Figure 3. Heating Coil Sleeve - Removal.

7. Loosen fuel line retaining nut and slide back. Disconnect fuel line from burner nozzle (Figure 5, Item 1).
8. Place drain pan under fuel pump (Figure 4, Item 1) to catch residual fuel.
9. Loosen and slide back fuel line retaining nut (Figure 4, Item 2) at fuel pump.
10. Disconnect fuel line at pump and drain residual fuel into drain pan.
11. Remove and discard fuel line.

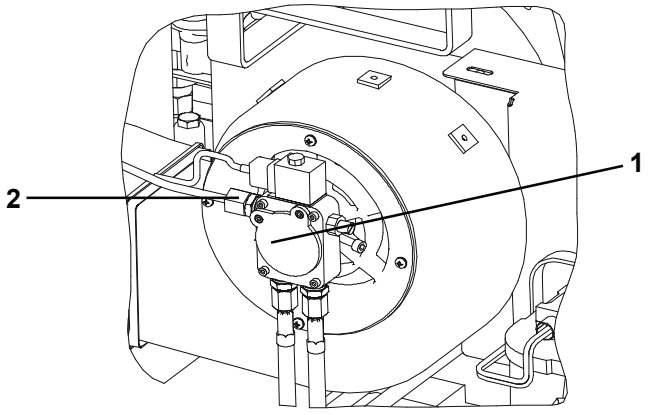


Figure 4. Burner Fuel Pump.

END OF TASK

INSTALLATION

1. Check to ensure there is no debris around and inside of fuel line couplings at burner fuel pump and at burner fuel nozzle (Figure 5, Item 1).
2. Position and install new fuel line at burner fuel nozzle (Figure 5, Item 1) and at burner fuel pump (Figure 4, Item 2).
   a. Screw on retaining nut at fuel pump and tighten.
   b. Screw on retaining nut at burner fuel nozzle and tighten both union nuts securely.
3. Install and tighten fuel line clamp (Figure 6, Item 1) at flow heater outer casing (Figure 6, Item 2).

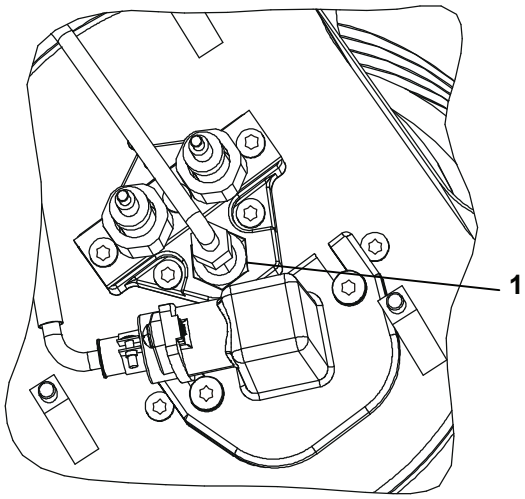


Figure 5. Burner Fuel Nozzle.

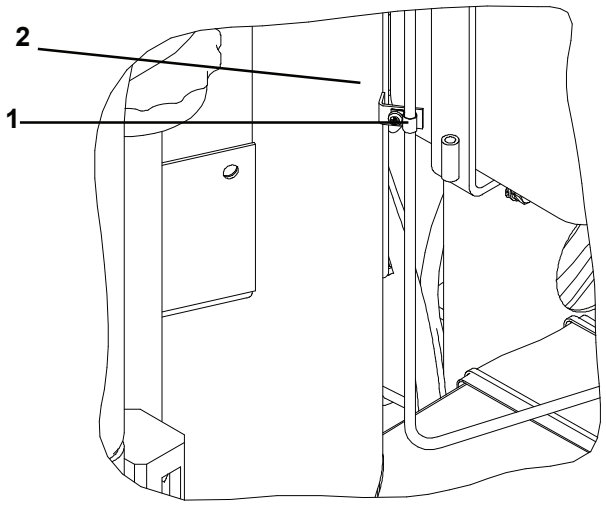


Figure 6. Heating Coil Sleeve - Installation.

INSTALLATION - CONTINUED

4. Connect applicator module battery.
   a. Attach negative terminal connector.
   b. Close terminal protective cover.
5. Operate applicator module normally using water (Operator's Manual, WP 0008). Check for fuel leaks at all connections.
6. Align and install burner top cover (Figure 7, Item 1) and secure with new lock washers and acorn nuts (Figure 7, Item 2).
7. Install blower cover (Figure 8, Item 2) and secure with three retaining screws (Figure 8, Item 1).
8. Install cable ties at locations where previously removed.

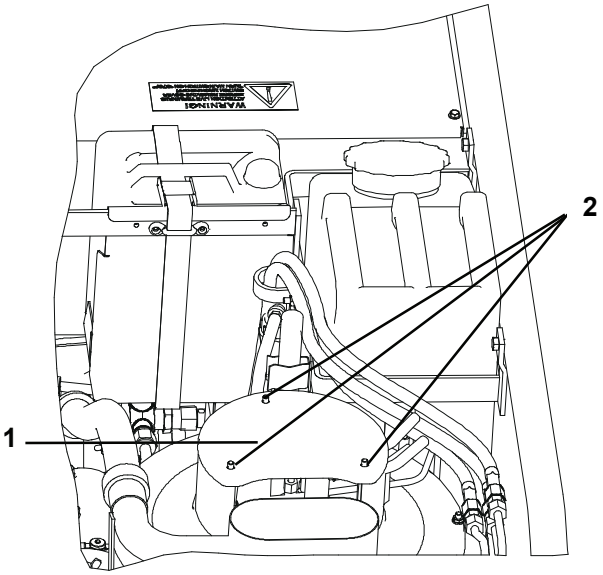


Figure 7. Burner Top Cover - Installation.

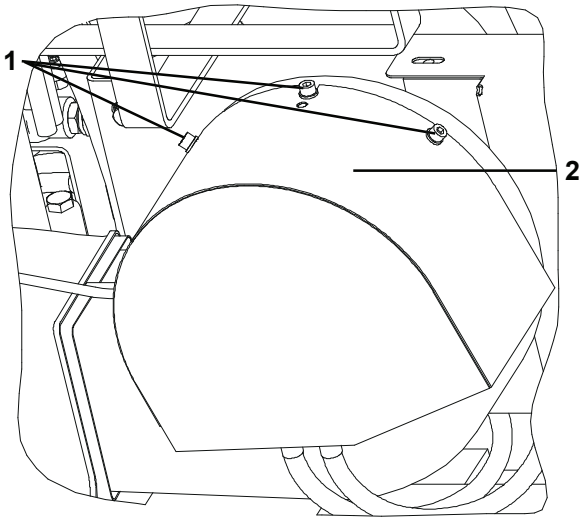


Figure 8. Blower Cover - Installation.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
FLOW HEATER REPLACEMENT

INITIAL SETUP:

Test Equipment
Not Applicable

Tools
Tool Kit, General Mechanic (WP 0082, Item 2)
Wrench, 27 mm (WP 0082, Item 3)

Materials/Parts
Heater, Water Liquid (WP 0074, Item 1)
Strap, Tie Down electrical (2) (WP 0070, Item 10)
Washer, Lock (3) (WP 0074, Item 5)
Washer, Lock (2) (WP 0076, Item 6)
Accessory Kit (WP 0082, Item 1)
Cloth, Cleaning (WP 0083, Item 3)
Pan, Drain (WP 0083, Item 8)

Personnel Required
Equipment Repairer/Mechanic (3)

References
TM 3-4230-238-10 WP 0048
WP 0013

Equipment Condition
Applicator module set on level ground
Engine off and cool
Applicator module is depressurized and drained of water

REMOVAL

WARNING

Always disconnect battery cables before performing maintenance to prevent electrical shock which could cause injury or death. Always wear eye protection and protective gloves when handling the battery.

Fuel is highly flammable and will cause serious injuries or death. Never smoke or have open flames within 50 feet (15 m) of the applicator module. Avoid fuel spills. Wear protective clothing, protective rubber gloves and chemical splash goggles.

NOTE

Second and third person only required for assistance with flow heater lifting.

1. Disconnect the applicator module battery.
   a. Unclip negative terminal protective cover.
   b. Remove negative terminal connector from battery.
2. Remove screw, flat and lock washers and nut (Figure 1, Item 2) securing engine exhaust pipe (Figure 1, Item 1) to burner sleeve (Figure 1, Item 3).

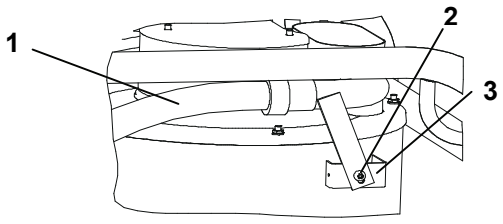


Figure 1. Engine Exhaust Pipe - Removal.

REMOVAL - CONTINUED

3. Loosen and remove three acorn nuts and lock washers (Figure 2, Item 1) that secure cover. Remove cover (Figure 2, Item 2)
4. Remove igniter plug cables from igniter electrodes (Figure 3, Item 1).

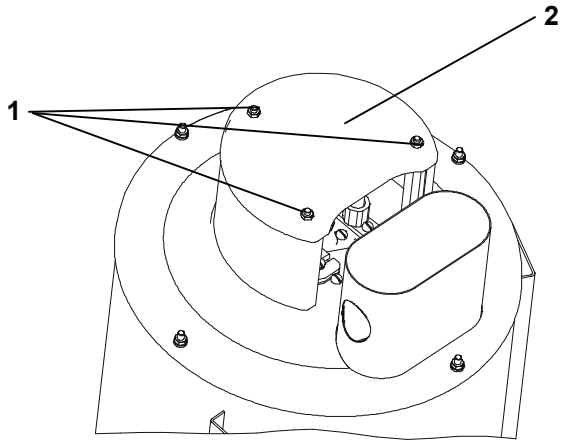


Figure 2. Burner Top Cover - Removal.

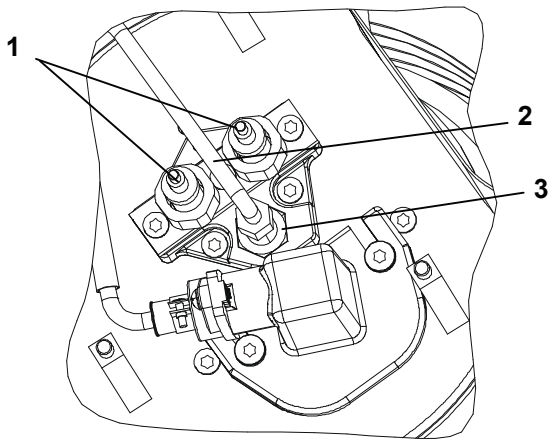


Figure 3. Burner Nozzle Assembly - Removal.

NOTE

In some instances, the burner fuel line may require complete removal from both ends (WP 0048).

5. Remove photo cell (Figure 4, Item 1) from photo cell holding device (Figure 4, Item 2) by sliding photo cell straight out.

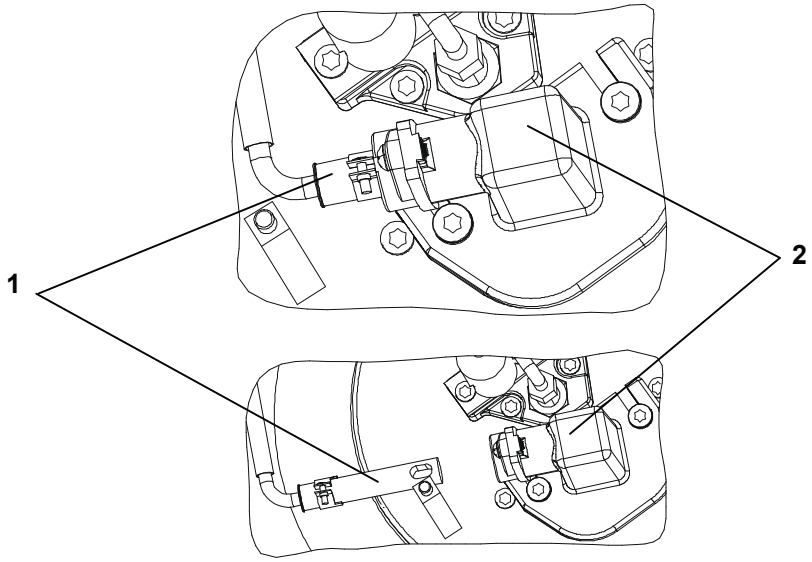


Figure 4. Burner Photo Cell Assembly Holding Device - Removal.

REMOVAL - CONTINUED

6. Loosen and remove screw and nut securing burner fuel line clamp (Figure 5, Item 1) to flow heater outer casing (Figure 5, Item 2).
7. Remove burner fuel line (Figure 3, Item 2) from burner nozzle (Figure 3, Item 3). Catch residual fuel in cleaning cloth.

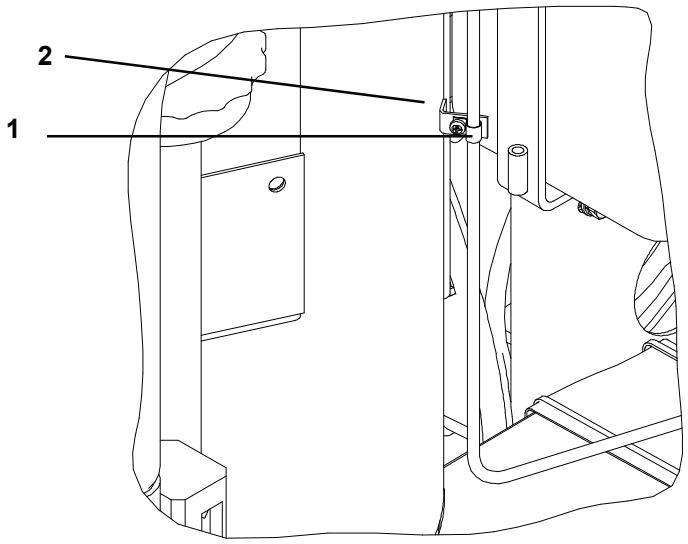


Figure 5. Fuel Line Clamp - Removal.

8. Loosen and remove two hex-head screws and washers (Figure 6, Item 1) securing fuel suction tube holder bracket (Figure 6, Item 2) to flow heater outer casing.

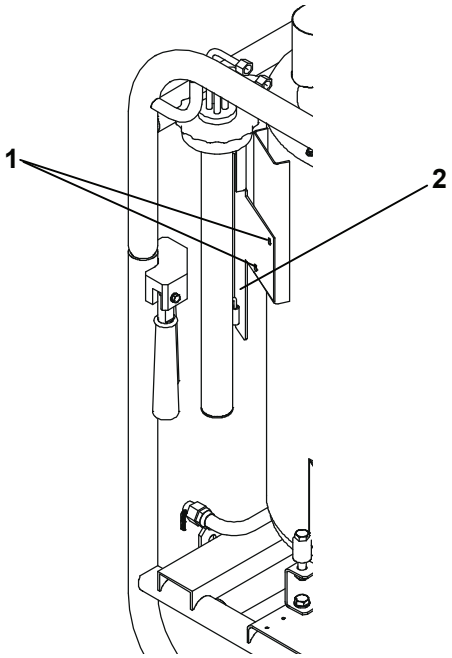


Figure 6. Fuel Tube Bracket - Removal.

REMOVAL - CONTINUED

9. Cut and remove both tension bands (Figure 7, Item 1).
10. Remove burner unit cloth collar (Figure 7, Item 2) by carefully sliding hole (Figure 1, Item 3) in collar over damper spring bracket (Figure 7, Item 4).

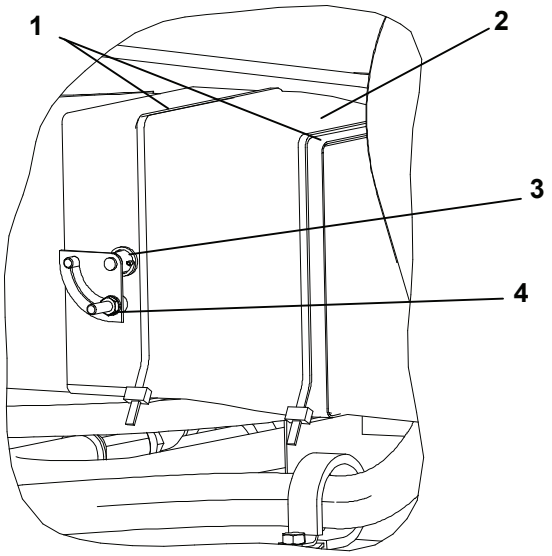


Figure 7. Cloth Collar Assembly - Removal.

11. Remove bolt, nut and washers from high-pressure outlet (Figure 8, Item 1).
12. Remove high-pressure outlet (Figure 8, Item 2) from flow heater bottom by turning pipe coupling (Figure 8, Item 3) counterclockwise until removed.

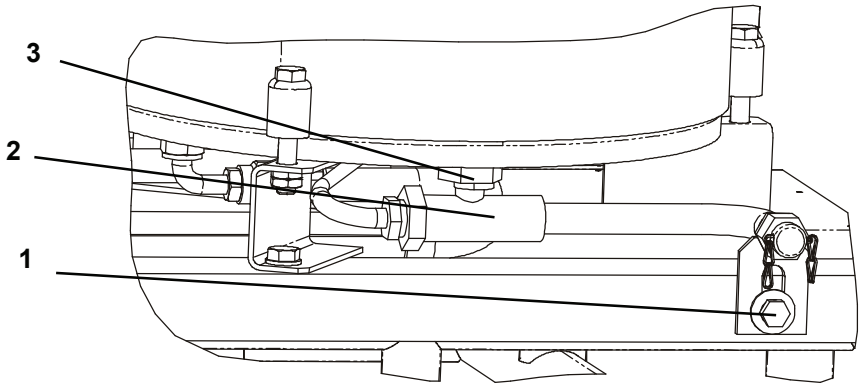


Figure 8. High-Pressure Burner Outlet - Removal.

REMOVAL - CONTINUED

13. Loosen and remove the high-pressure burner output hose connection at the flow heater (WP 0013).

WARNING

Ensure hands do not become pinched in equipment when performing the following procedure.

14. Loosen and remove three bolts (Figure 9, Item 1) (one bolt is located behind flow heater) and six nuts. Three nuts are used as jam nuts (Figure 9, Item 2) (one nut is located behind flow heater). Remove flow heater outer casing pulling upward to clear frame.

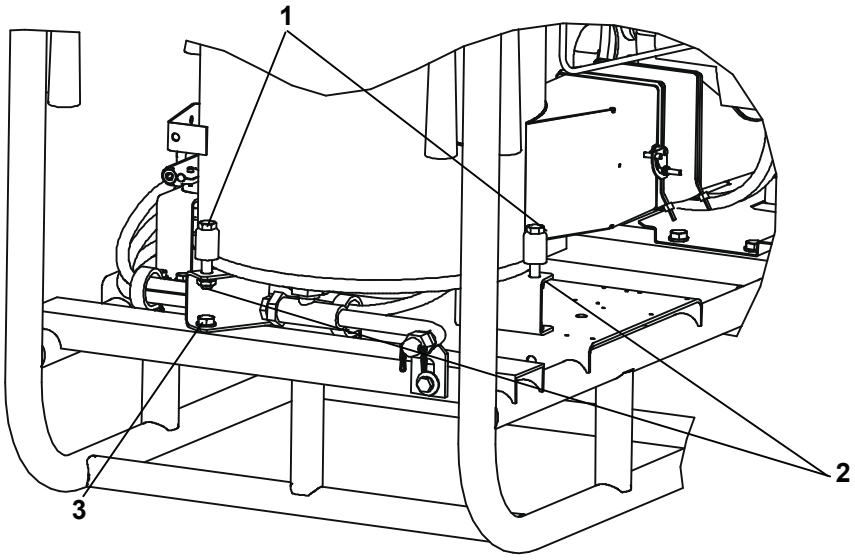


Figure 9. Flow Heater Outer Casing - Removal.

15. Loosen and remove three bolts and nuts (Figure 9, Item 3) (two nuts are located behind flow heater) securing flow heater to frame assembly.
16. Thread high pressure outlet pipe and thermostat sensor wire under unit and away from flow heater.

WARNING

The weight of the flow heater is in excess of 100 lbs which will require a three person lift. Always avoid back injury by lifting with your legs.

17. Remove flow heater by tilting the top of flow heater outward to equipment's left side. Slowly move bottom in opposite direction until flow heater can be completely removed.

END OF TASK

INSTALLATION

WARNING

The weight of the flow heater is in excess of 100 lbs which will require a three person lift. Always avoid back injury by lifting with your legs.

1. Position and align flow heater onto frame assembly ensuring high pressure outlet faces toward back of applicator module.
2. Install three bolts, washers and nuts (Figure 9, Item 1). Do not tighten.
3. Position high pressure outlet (Figure 10, Item 1) at bottom of flow heater.
4. Install high-pressure outlet hose to flow heater (WP 0013).
5. Install and secure high-pressure outlet (Figure 10, Item 1) turning coupling clockwise. Tighten coupling.
6. Secure outlet with bolt, nut, and washers (Figure 10, Item 2).

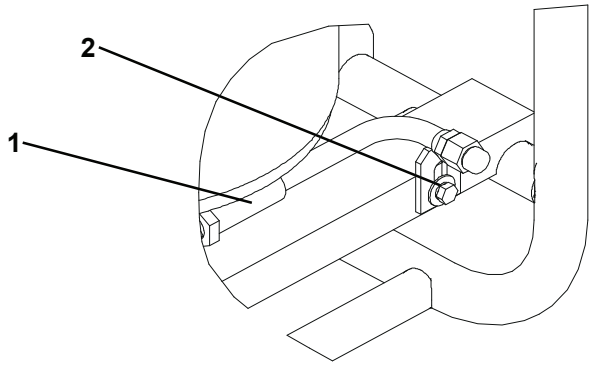


Figure 10. High-Pressure Burner Outlet - Installation.

CAUTION

Ensure sealing cord is not exposed. Failure to do so could result in damage to equipment

NOTE

During heating coil sleeve installation ensure the seal on flow heater bottom is in place.

7. Install flow heater outer casing.
8. Align three mounting points (Figure 11, Item 1) and install three bolts, washers, and nuts. Do not tighten.

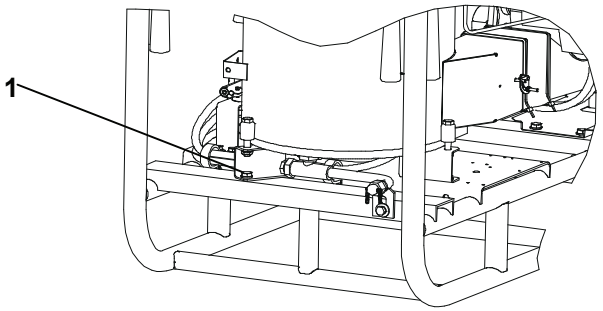


Figure 11. Flow Heater Mounting - Installation.

INSTALLATION - CONTINUED

9. Install cloth collar (Figure 12, Item 2) onto flow heater and blower assembly. Secure with tension bands (Figure 12, Item 1).

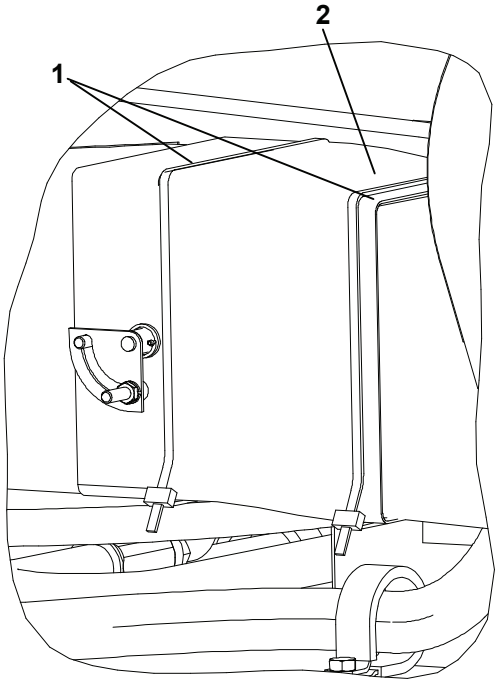


Figure 12. Cloth Collar Assembly - Installation.

10. Install fuel tube holding bracket (Figure 13, Item 1) to flow heater outer casing. Secure with two hex screws and new lock washers.

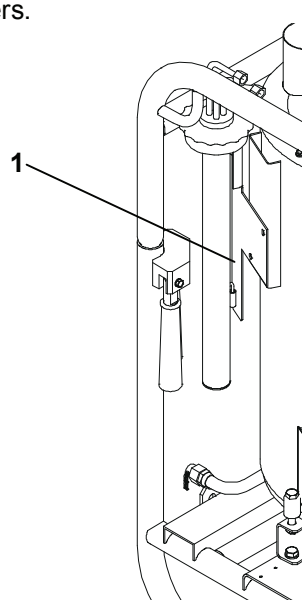


Figure 13. Fuel Tube Bracket - Installation.

INSTALLATION - CONTINUED

11. Install burner fuel line (Figure 15, Item 2) to burner nozzle (Figure 15, Item 3)

12. Align index and install photo cell (Figure 14, Item 1) into photo cell holder (Figure 14, Item 3). Ensure photo cell is installed to retaining clip with screw at top position (Figure 14, Item 2).

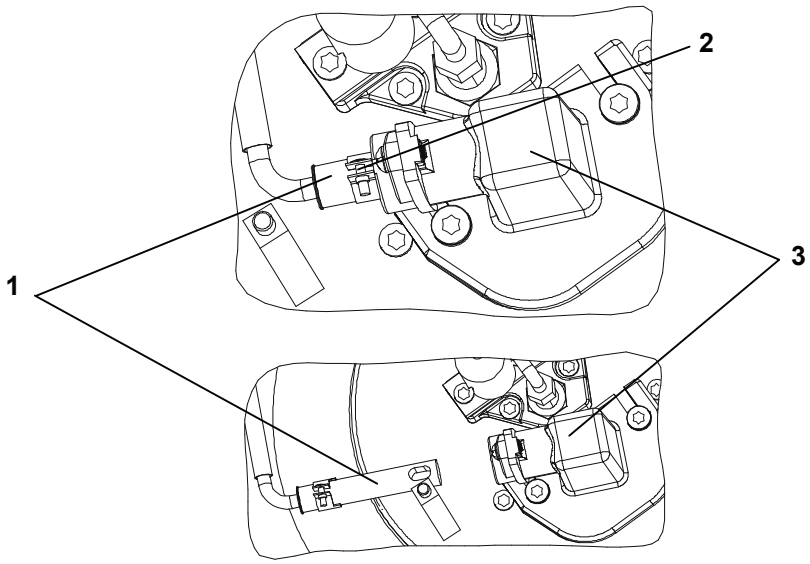


Figure 14. Burner Photo Cell Assembly Holding Device - Installation.

13. Install igniter plug cables to igniter electrodes (Figure 15, Item 1).

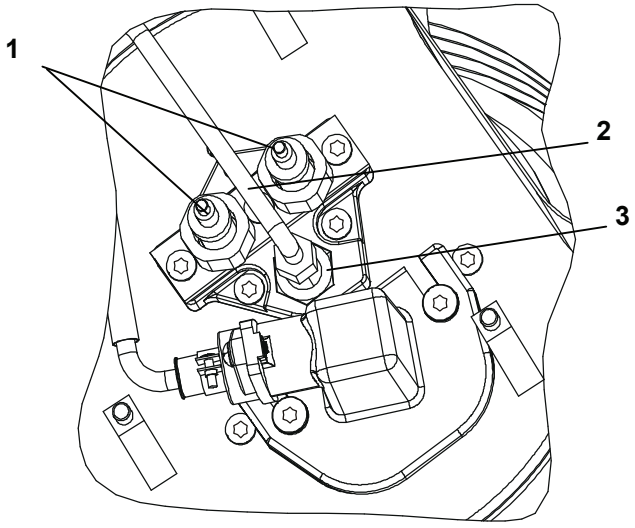


Figure 15. Burner Nozzle Assembly - Installation.

INSTALLATION - CONTINUED

14. Install burner top cover (Figure 16, Item 2) and tighten with three acorn nuts and new lock washers (Figure 16, Item 1).

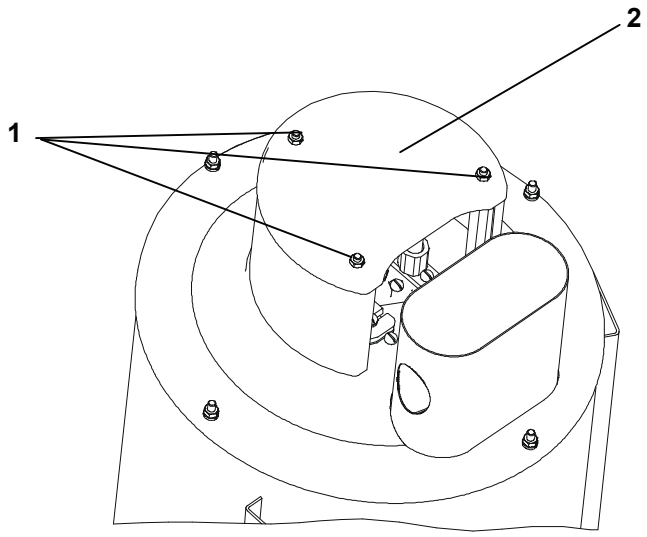


Figure 16. Burner Top Cover - Installation.

15. Install burner fuel line to flow heater outer casing using clamp (Figure 17, Item1), screw, washer and nut. Tighten screw and nut.

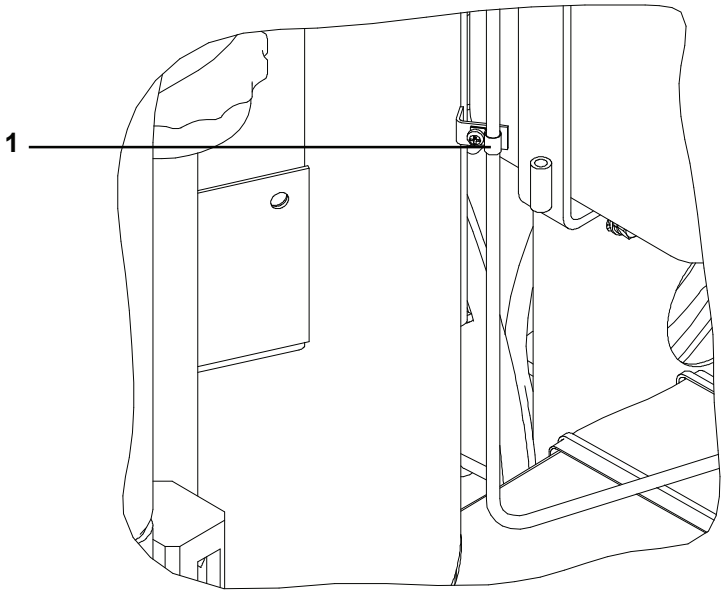


Figure 17. Heating Coil Sleeve - Installation.

INSTALLATION - CONTINUED

16. Install engine exhaust pipe (Figure 18, Item 1) and secure to burner sleeve (Figure 18, Item 3). Secure with screw, washers and nut (Figure 18, Item 2).

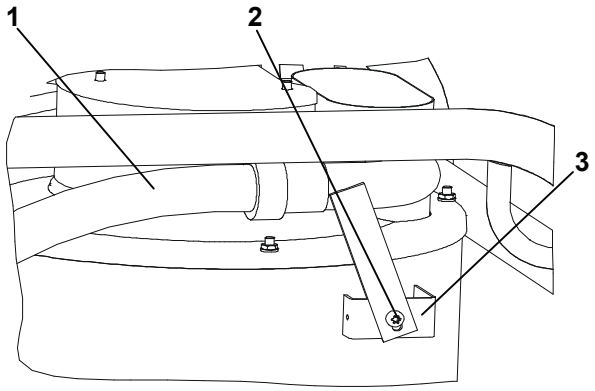


Figure 18. Engine Exhaust Pipe - Installation.

17. Tighten flow heater frame mounting bolts and nuts.
18. Tighten heating coil sleeve retaining bolts and nuts. Ensure screws are tightened evenly until screws can be turned slightly.
19. Secure base nut with jam nut and tighten.
20. Reconnect applicator module battery.
    c. Attach negative terminal connector.
    d. Close terminal protective cover.
21. Operate applicator module (Operator's Manual, WP 0008), test operation and check for leaks.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
ENGINE REPLACEMENT

INITIAL SETUP:

Test Equipment

Not Applicable

Tools

Tool Kit, General Mechanic (WP 0082, Item 2)
Three Jaw puller, (WP 0082 Item 3)
Wrench, torque ft lb (WP 0082, Item 3)

Materials/Parts

Engine, Diesel (WP 0075, Item 1)
Hex Nut (4) (WP 0075, Item 70)
Accessory Kit (WP 0082, Item 1)
Oil, Engine (WP 0083, Item 6)
Pan, Drain (WP 0083, Item 8)
Cloth, Cleaning (WP 0083, Item 3)
Sleeve, Heat shrink (WP 0083, Item 9)
Tags, Marking (WP 0083, Item 12)
Strap, Tiedown electrical (WP 0083, Item 11)
Insulation sleeve (3) (WP 0083, Item 15)

Personnel Required

Equipment Repairer/Mechanic (2)

References

TM 3-4230-238-10 WP 0061
WP 0011 WP 0064

Equipment Condition

Applicator module set on level ground
Engine off and cool

INTRODUCTION

NOTE

Second person only required for assistance with engine lifting.

This work package covers the replacement of the applicator module's diesel engine. Several applicator module components must be removed during the replacement procedures. Figure 1 displays the component locations and Table 1 identifies the components.

NOTE

Replacement engine may have engine adapter and drive pulley already mounted.

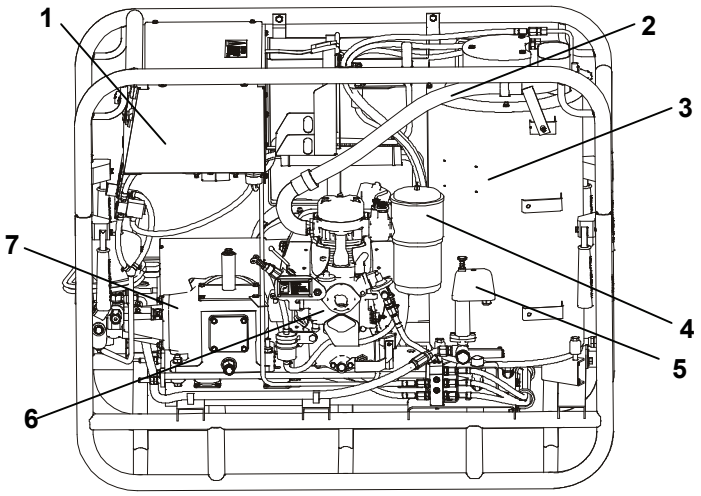


Figure 1. Applicator Module (Sheet 1 of 2).

INTRODUCTION - CONTINUED

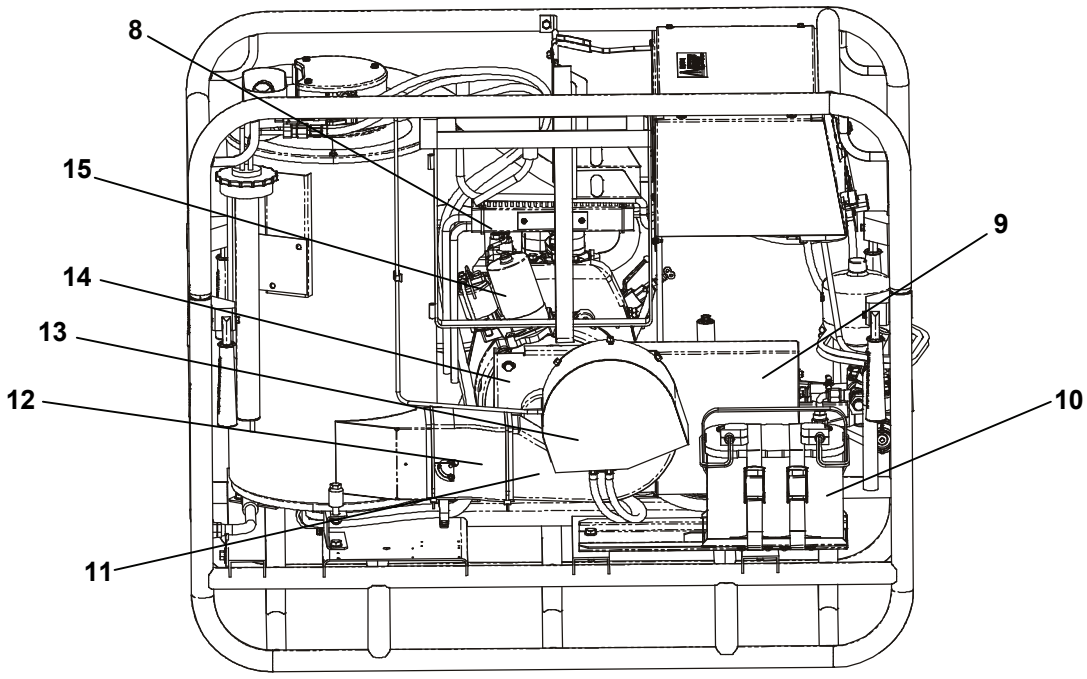


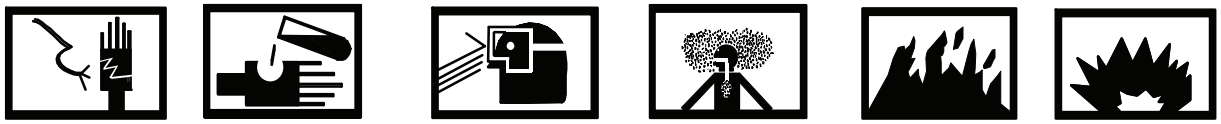
Figure 1. Applicator Module (Sheet 2 of 2).

Table 1. Applicator Module Component Locations.

ITEM NO.	COMPONENT NAME
1	Control Box
2	Diesel Engine Exhaust Pipe
3	Flow Heater (Burner)
4	Air Filter Assembly
5	Safety System
6	Diesel Engine Assembly
7	Water Pump
8	Wiring Harness Bundle
9	Water Pump V-Belt Cover
10	Battery
11	Blower Unit
12	Burner Unit Cloth Collar
13	Blower Cover
14	Blower Mounting Plate Assembly
15	Engine Starter

REMOVAL

WARNING



Always disconnect battery cables before performing maintenance to prevent electrical shock which could cause injury or death. Always wear eye protection and protective gloves when handling the battery.

Fuel fumes are highly flammable and will cause serious injuries or death. Wear protective clothing, protective rubber gloves and chemical splash goggles.

When working with motor oil, avoid prolonged or repeated inhalation of oil mist to prevent possible lung injury. If coughing or difficulty breathing develops, seek medical attention. Dispose of product in accordance with Local, State, and Federal Hazardous Waste regulations.

The engine weighs approximately 90 lbs. and requires a three person lift. Always avoid back injury by lifting with your legs.

1. Disconnect applicator module battery.
   a. Unclip negative terminal protective cover.
   b. Remove negative terminal connector from battery.
2. Loosen and remove bolt and nut (Figure 2, Item 1) to disconnect main ground wire (Figure 2, Item 2) on top of engine.

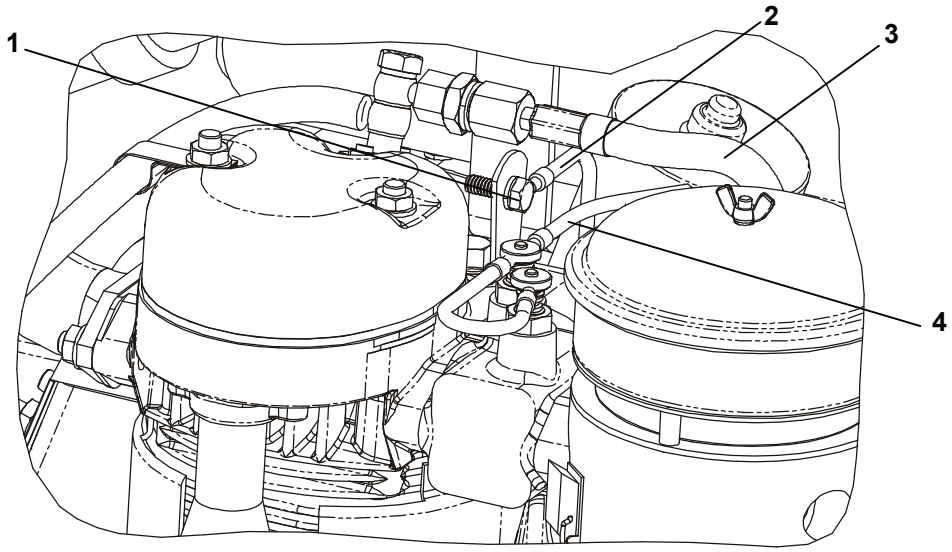


Figure 2. Top of Engine - Removal.

REMOVAL - CONTINUED

3. Remove and tag solenoid wire (Figure 3, Item 1) and power cable (Figure 3, Item 2) from starter.
4. Remove engine oil drain plug (Figure 4, Item 1) and drain engine oil in drain pan. Install engine oil drain plug.

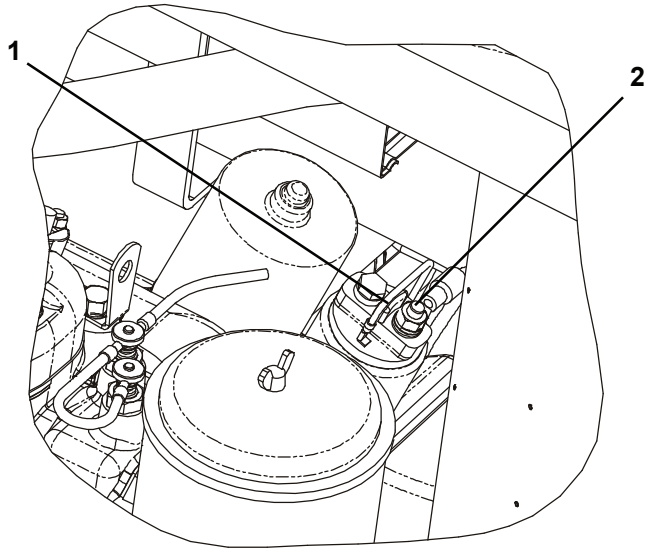


Figure 3. Starter Assembly.

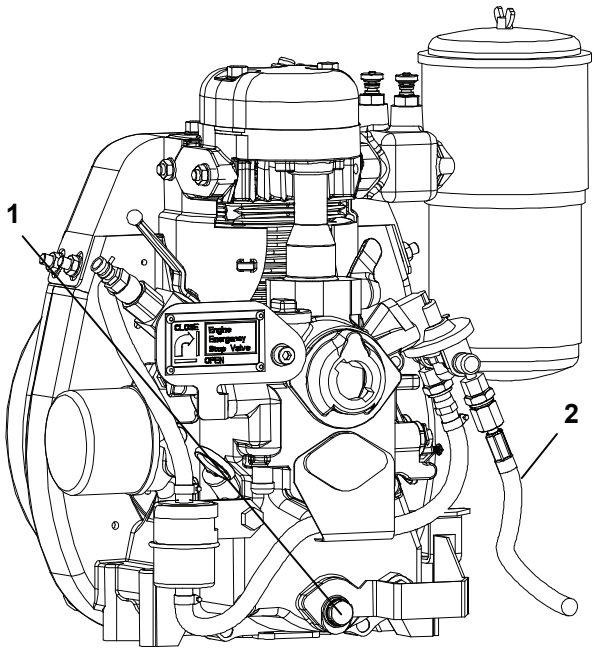


Figure 4. Engine.

5. Disconnect fuel supply line (Figure 4, Item 2) and fuel return line (Figure 2, Item 3) from engine. Drain fuel into drain pan.
6. Remove water pump and blower V-belts (WP 0011).
7. Remove throttle cable (WP 0061).
8. Remove exhaust pipe (WP 0064).

REMOVAL - CONTINUED

9. Disconnect and tag engine air intake pre-heater wire (Figure 2, Item 4).
10. Remove oil heater protective cover (Figure 5, Item 2). Retain for re-installation.
11. Disconnect and tag engine oil heater wire (Figure 5, Item 1).

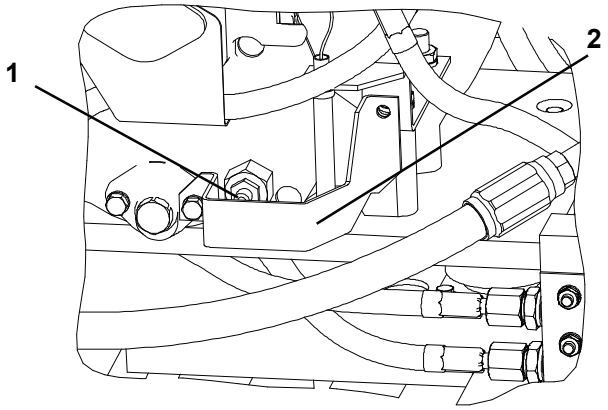
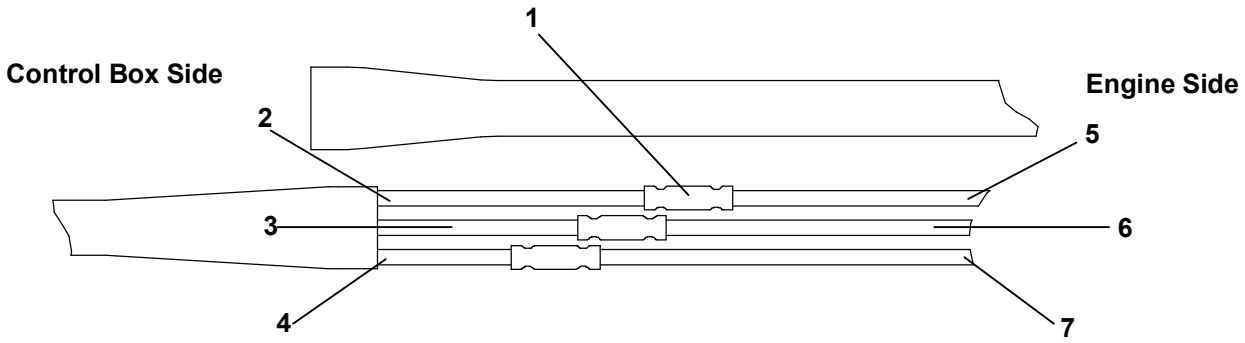


Figure 5. Engine Oil Heater.

12. Slide panel off wiring harness bundle
13. Cut cable ties.
14. Trace wires from engine and slide engine wiring bundle out of housing.
15. Remove engine wire bundle protective sleeve.
16. Cut engine generator wires at wire butt connectors (Figure 6, Item 1) on control box side of engine wiring harness.



Control Box Side	Engine Side
2. Black wire	5. Yellow wire
3. Red wire	6. Red Wire
4. Black wire	7. Yellow Wire

Figure 6. Engine Generator Wires - Removal.

REMOVAL - CONTINUED

17. Remove mounting bolts, nuts and washers (Figure 7, Item 1 and Figure 8, Item 1) and retain them.

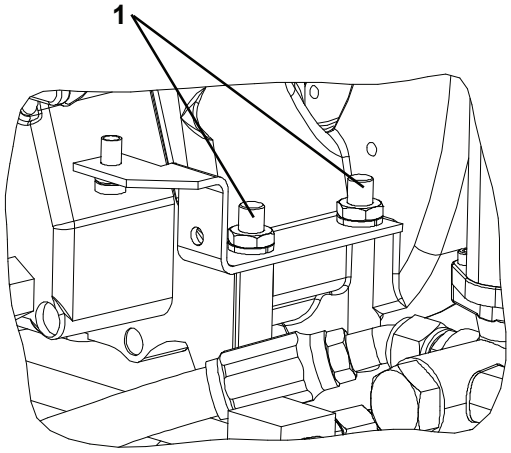


Figure 7. Engine Bolts – Engine Right Side.

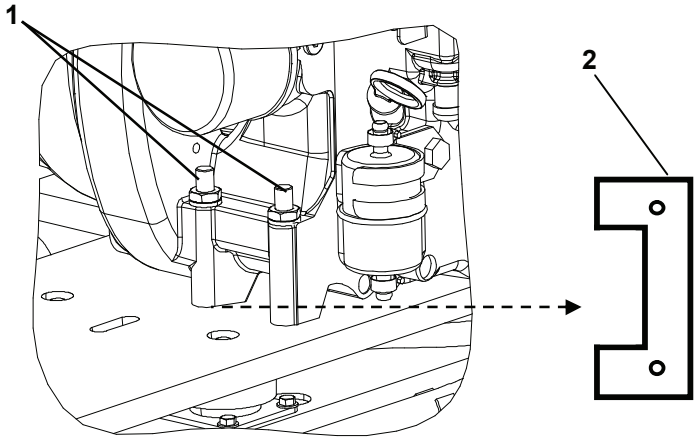


Figure 8. Engine Bolts – Engine Left Side.

NOTE

Engine removal requires a two-person lift.

18. Slide engine from base plate and place on firm and level surface.
19. Retain two engine spacers (Figure 8, Item 2) for installing replacement engine.

END OF TASK

INSTALLATION

NOTE

Two people are required to remove and install the pulley.

1. If replacement engine does not have engine adapter and drive pulley installed, remove them from original engine and install on replacement engine as follows:

   a. Remove hex-head bolt (Figure 9, Item 2) and washer that retain blower/ water pump belt pulley (Figure 9, Item 1).

   b. Using three jaw puller remove pulley from original engine drive adapter (Figure 9, Item 3). Tap lightly with non-metal mallet to remove.

   c. Remove four bolts (Figure 10, Item 1) from drive adapter.

   d. Install drive adapter onto crankshaft of replacement engine and secure with four bolts (Figure 10, Item 1). Torque bolts to 17 ft lbs.

   e. Install blower/water pump belt pulley (Figure 9, Item 1) onto drive adapter and secure hex-head bolt (Figure 9, Item 2) and washer. Torque bolt to 17 ft lbs.

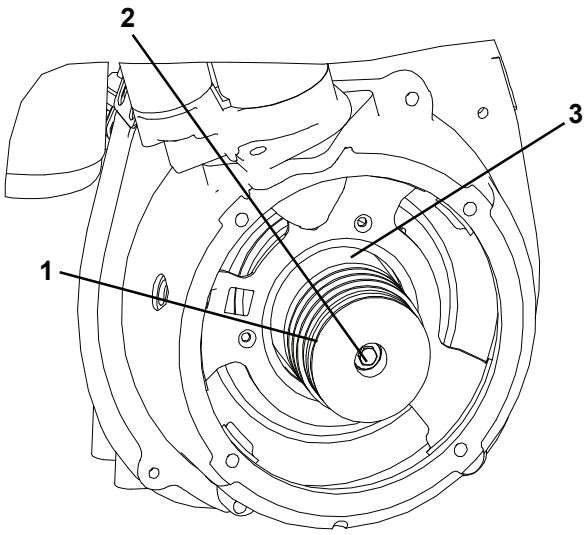


Figure 9. Engine Drive Adapter With Pulley.

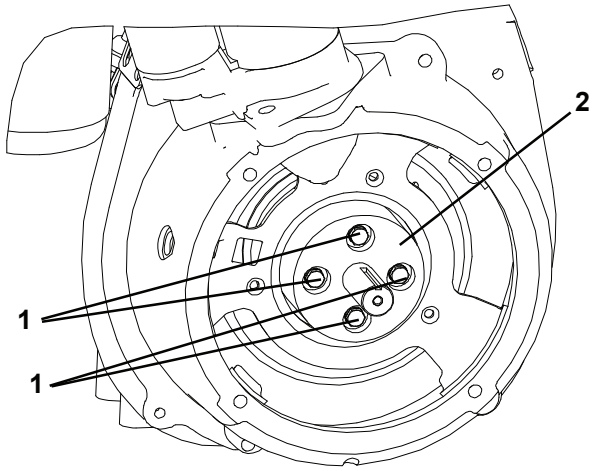


Figure 10. Engine Drive Adapter Without Pulley.

INSTALLATION – CONTINUED

NOTE

Engine installation requires a two-person lift.

2. Position replacement engine onto base plate and align four engine mounting holes.
3. Insert and align two engine spacers (Figure 8, Item 2) between engine and base plate.
4. From bottom up, insert four engine mounting bolts and washers (Figure 7, Item 1 and Figure 8, Item 1).
5. Connect oil heater wire (Figure 11, Item 2) to oil heater. Secure with washer and nut. Remove wire tag.
6. Position oil heater protective cover to right side of engine.
7. Install oil heater protective cover with engine mounting bolts. Do not tighten.
8. Remove right side drain plug mounting plate bolt and washer (Figure 11, Item 1) from replacement engine.
9. Align oil heater protective cover (Figure 11, Item 3) to engine right side drain plug mounting plate bolt hole.
10. Install drain plug mounting plate bolt and washer (Figure 11, Item 1). Ensure that the copper washer is inserted between the bracket and the engine. Tighten bolt.

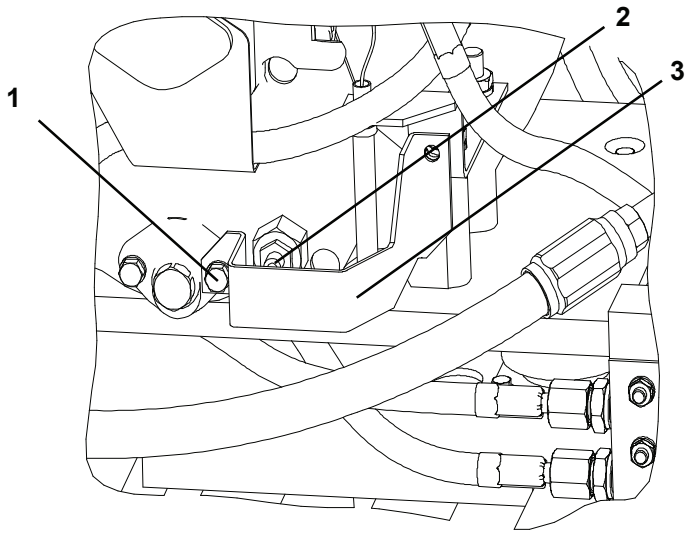


Figure 11. Drain Plug Mounting Plate Assembly.

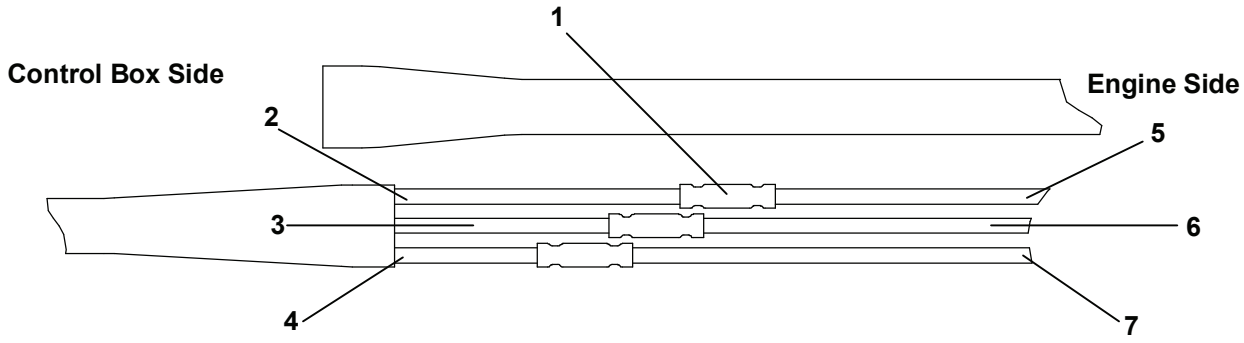
11. Install four washers and new lock nuts to engine mounting bolts (Figure 7, Item 1 and Figure 8, Item 1) and tighten.

INSTALLATION – CONTINUED

CAUTION

Do not use electrical tape to bundle wires. This could result in damage to equipment

12. Slide protective sleeve over control box side wires (Figure 12, Items 2, 3 and 4). re-bundle wires.
13. Connect engine side wires (Figure 12, Items 5, 6 and 7) and control box side wires (Figure 12, Items 2, 3 and 4) with wire butt connectors.



Control Box Side	Engine Side
2. Black wire	5. Yellow wire
3. Red wire	6. Red Wire
4. Black wire	7. Yellow Wire

Figure 12. Engine Generator Wires - Installation.

14. Slide protective sleeve over wire butt connectors and re-bundle wires.
15. Install new cable ties, replace bundle inside housing and reinstall panel on bundle.
16. Connect air pre-heater wire (Figure 13, Item 3). Remove wire tag.
17. Connect throttle cable (WP 0061).

NOTE

Perform installation tasks in the following procedure but do not reconnect battery at end of WP 0011.

18. Connect water pump and blower V-belts (WP 0011).
19. Connect fuel supply line (Figure 4, Item 2) and fuel return line (Figure 2, Item 3) to engine.

INSTALLATION – CONTINUED

20. Reconnect main ground wire (Figure 13, Item 2) on top of engine with bolt and nut (Figure 13, Item 1) and tighten.

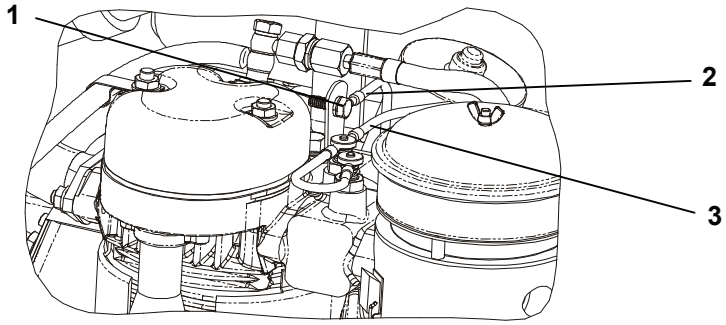


Figure 13. Top of Engine – Installation.

21. Connect exhaust pipe (WP 0064).
22. Re-connect solenoid wire (Figure 3, Item 1) and power cable (Figure 3, Item 2) at starter assembly. Remove wire tag.
23. Fill engine with oil.
    a. Remove oil ÿller cap (Figure 14, Item 1).
    b. Fill with 15W40 engine oil in ÿller opening until upper marking of dipstick is reached.
    c. Reinstall oil ÿller cap (Figure 14, Item 1).

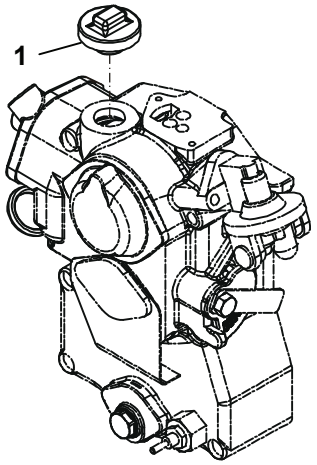


Figure 14. Oil Filler Cap

24. Connect battery.
    a. Attach negative terminal connector.
    b. Close terminal protective cover.
25. Start engine (Operator's Manual, WP 0007) and check for proper operation.
26. Operate applicator module in 120 °F and 175 °F modes of operation (Operator's Manual, WP 0008) to ensure proper operation of applicator module.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
CHANGE ENGINE OIL AND OIL FILTER REPLACEMENT

INITIAL SETUP:

Test Equipment
Not Applicable

Personnel Required
Equipment Repairer/Mechanic

Tools
Tool Kit, General Mechanic (WP 0082, Item 2)

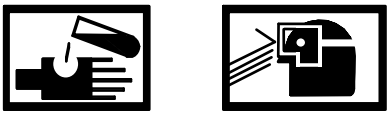
References
TM 3-4230-238-10

Materials/Parts
Filter (WP 0075, Item 20)
Cap, Oil Filler (WP 0075, Item 12)
Gasket (WP 0075, Item 11)
Plug, Pipe (WP 0075, Item 19, if required)
Gasket (WP 0075, Item 18, if required)
Cloth, Cleaning (WP 0083, Item 3)
Pan, Drain (WP 0083, Item 11)
Oil, Engine (WP 0083, Item 6)

Equipment Condition
Applicator module set on level ground
Engine off and warm

CHANGE ENGINE OIL AND OIL FILTER

WARNING



CHEMICAL **EYE PROTECTION**

When working with motor oil, avoid contact with eyes. Wear protective clothing and protective rubber gloves. Avoid prolonged or repeated inhalation of oil mist to prevent possible lung injury. If coughing or difficulty breathing develops, seek medical attention. Dispose of product in accordance with Local, State and Federal Hazardous Waste regulations.

NOTE

Change the oil only when the engine is warm.

1. Remove and clean oil filler cap (Figure 1, Item 1), inspect oil filler cap and gasket (Figure 1, Item 2) and replace, if necessary.
2. Position drain pan under oil drain plug; remove oil drain plug (Figure 1, Item 3) and gasket and drain oil.
3. Clean oil drain plug (Figure 1, Item 3) and inspect oil drain plug threads and gasket for damage. If threads or gasket are damaged, replace drain plug or gasket.

CHANGE ENGINE OIL AND OIL FILTER- CONTINUED

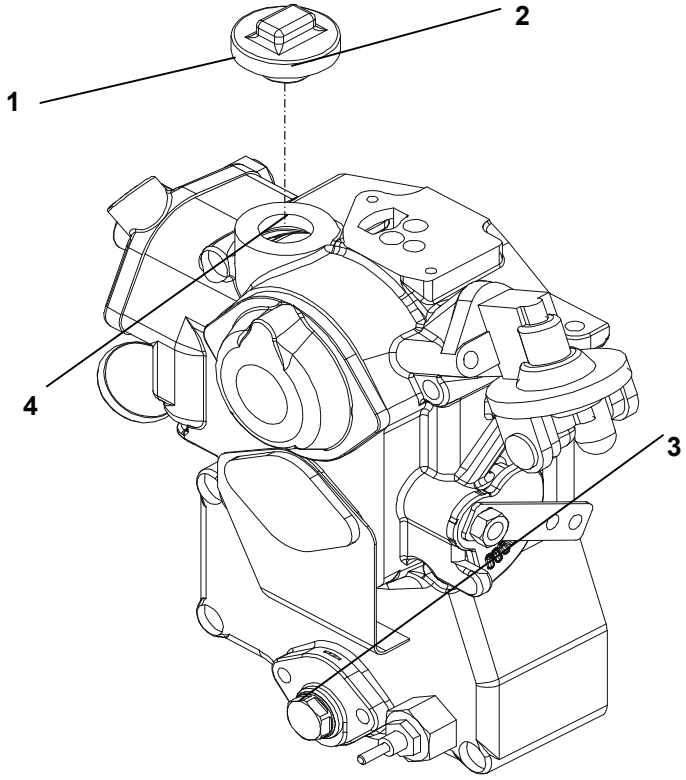


Figure 1. Oil Drain Plug and Filler Cap Assembly.

4. Reinstall oil drain plug (Figure 1, Item 3).
5. Replace oil filter:
   a. Using cleaning cloth, grasp oil filter (Figure 2, Item 1), turn it counterclockwise, and remove it from side of engine. Discard oil filter IAW local OP.
   b. Clean oil filter engine mounting area with clean cloth.

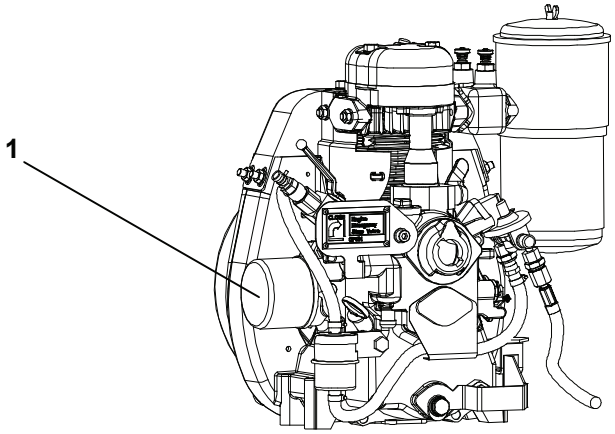


Figure 2. Oil Filter.

CHANGE ENGINE OIL AND OIL FILTER - CONTINUED

c. Coat gasket of new oil filter with a small amount of clean engine oil.

CAUTION

Excessive torque can damage the oil filter. Tighten the oil filter only by hand.

d. Install and tighten new oil filter onto side of engine, rotating filter clockwise as it is inserted

6. Fill engine through filler opening (Figure 1, Item 4) with 15W-40 engine oil until upper marking of dipstick is reached (oil quantity required, approximately 1 quart).
7. Reinstall filler cap (Figure 1, Item 1). Tighten cap enough to prevent entry of dust and dirt.
8. Start engine (Operator's Manual WP007) and observe oil drain plug and filter for oil leakage.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
OIL DIPSTICK REPLACEMENT

INITIAL SETUP:

Test Equipment
Not Applicable

Tools
Tool Kit, General Mechanic (WP 0082, Item 2)

Materials/Parts
Gage, Rod, Liquid Level (WP 0075, Item 17)
Cloth, Cleaning (WP 0083, Item 3)

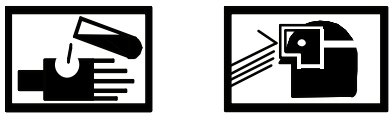
Personnel Required
Equipment Repairer/Mechanic

References
Not Applicable

Equipment Condition
Applicator module set on level ground
Engine off

REMOVAL

WARNING



CHEMICAL **EYE PROTECTION**

When working with motor oil, avoid contact with eyes. Wear protective clothing and protective rubber gloves. Avoid prolonged or repeated inhalation of oil mist to prevent possible lung injury. If coughing or difficulty breathing develops, seek medical attention. Dispose of product in accordance with Local, State and Federal Hazardous Waste regulations.

1. Remove dipstick (Figure 1, Item 1) from engine.
2. Inspect dipstick (Figure 1, Item 1) for bends, breaks, and missing O-rings. Replace dipstick if missing components or damaged.

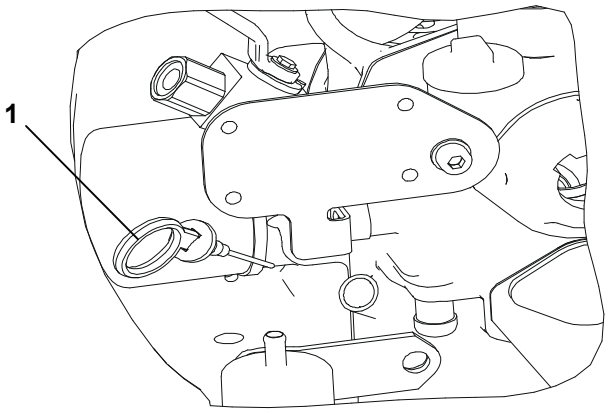


Figure 1. Dipstick Assembly - Removal.

INSTALLATION

Install dipstick (Figure 2, Item 1) into engine.

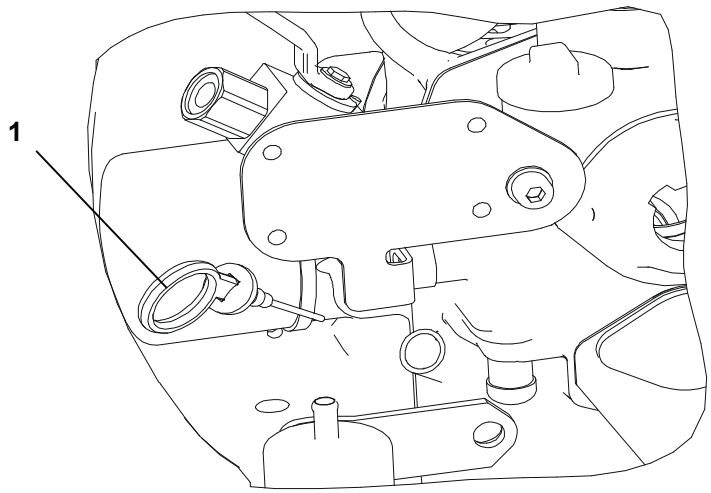


Figure 2. Dipstick Assembly - Installation.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
SERVICE AIR FILTER ASSEMBLY

INITIAL SETUP:

Test Equipment
Not Applicable

Tools
Tool Kit, General Mechanic (WP 0082, Item 2)

Materials/Parts
Filter Element (WP 0075, Item 48)
Wing nut (WP 0075, Item 37)
Cover, Access (WP 0075, Item 38)
Bowl Sediment (WP 0075, Item 39)
Deflector Air Cleaner (WP 0075, Item 40)
Intermediate Bottom (WP 0075, Item 41)
Stud Plain (WP 0075, Item 42)
Catch, Clamping (WP 0075, Item 46)
Solvent, Cleaning (WP 0083,Item 10)
Cloth, Cleaning (WP 0083, Item 3)

Personnel Required
Equipment Repairer/Mechanic

References

Equipment Condition
Applicator module set on level ground
Engine off

AIR FILTER ELEMENT REMOVAL

1. Release two filter cup retaining clips (Figure 1, Item 1).
2. Remove filter cup (Figure 1 Item 2) and filter element (Figure 1, Item 3) from housing (Figure 1, Item 4)
3. Using cleaning cloth, wipe any loose debris from filter cup (Figure 1, Item 2).

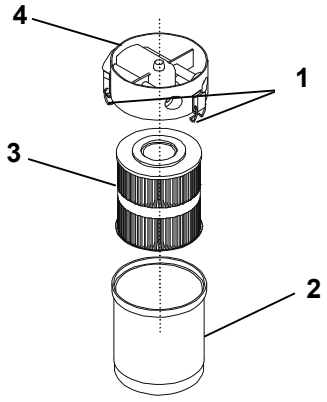


Figure 1. Air Filter Element.

END OF TASK

AIR FILTER ELEMENT INSTALLATION

1. Install new filter element (Figure 1, Item 3) into filter cup (Figure 1, Item 2) with filter element opening facing up.
2. Install filter cup (Figure 1, Item 2) into air filter housing (Figure 1, Item 4) and secure with two retaining clips (Figure 1, Item 1).

END OF TASK

AIR FILTER ASSEMBLY DISASSEMBLY

1. Remove wing nut (Figure 2, Item 1) and lift off cover (Figure 2, Item 2).
2. Lift off sediment bowl (Figure 2, Item 3).
3. Lift off deflector (Figure 2, Item 4).
4. Remove intermediate bottom (Figure 2, Item 5).
5. Release two retaining clamps (Figure 2, Item 6) on filter body intake (Figure 2, Item 7).
6. Remove filter element (Figure 2 Item 9) from cup (Figure 2, Item 8) and empty cup of any accumulated dirt or dust.

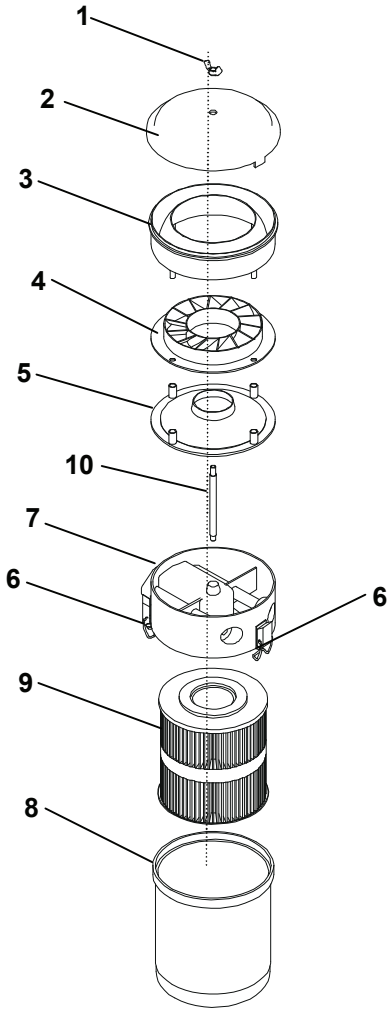


Figure 2. Air Filter Components - Disassembly.

END OF TASK

AIR FILTER ASSEMBLY INSPECTION

1. Inspect cover (Figure 3, Item 2), sediment bowl (Figure 3, Item 3), deflector (Figure 3, Item 4), intermediate bottom (Figure 3, Item 5) and cup (Figure 3, Item 8) for dents, distortion, and damaged mating surfaces. If damaged, replace component.
2. Inspect retaining clamps (Figure 3, Item 6) for distortion or damage that reduces their ability to retain cup (Figure 3, Item 8) securely. If damaged, replace damaged retaining clamps.
3. Inspect filter body (Figure 3, Item 7) for cracks and damaged mating surfaces. If damaged, replace air filter assembly.
4. Inspect stud (Figure 3, Item 9) and wing nut (Figure 3, Item 1) for stripped threads, and loose mounting in filter body (Figure 3, Item 7). Tighten stud if loose. If damaged, replace stud and wing nut.

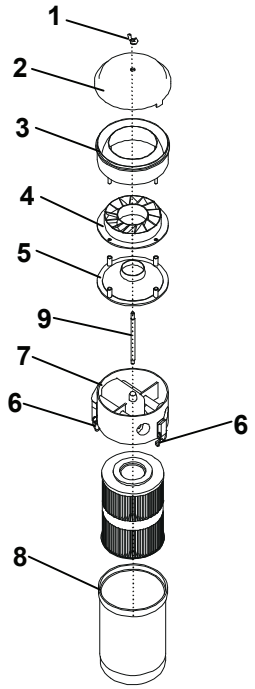


Figure 3. Air Filter Components - Inspection.

END OF TASK

ASSEMBLE AIR FILTER ASSEMBLY

1. Install new filter element (Figure 2, Item 9) into filter cup (Figure 2, Item 8) with filter element opening facing up.
2. Install filter cup (Figure 2, Item 8) into filter body (Figure 2, Item 7) and secure with two retaining clamps (Figure 2, Item 6).
3. Install intermediate bottom (Figure 2, Item 5).
4. Install deflector (Figure 2, Item 4).

ASSEMBLE AIR FILTER ASSEMBLY – CONTINUED

5. Install sediment bowl (Figure 2, Item 3).
6. Install cover (Figure 2, Item 2) and secure cover (Figure 2, Item 2) with wing nut (Figure 2, Item 1).

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
REPLACE AIR FILTER ASSEMBLY

INITIAL SETUP:

Test Equipment
Not Applicable

Tools
Tool Kit, General Mechanic (WP 0082, Item 2)

Materials/Parts
Gasket (WP 0075, Item 44)
Nut, Self Locking (2) (WP 0075, Item 47)
Nut, Hex (3) (WP 0075, Item 70)
Washer, Lock (WP 0075, Item 65)
Air Cleaner Intake (WP 0075, Item 36)
Solvent, Cleaning (WP 0083,Item 10)
Cloth, Cleaning (WP 0083, Item 3)

Personnel Required
Equipment Repairer/Mechanic

References
WP 0050 WP 0011

Equipment Condition
Applicator module set on level ground
Engine off
Water Pump V-Belt removed (WP 0011)

AIR FILTER ASSEMBLY REMOVAL

WARNING

BIOLOGICAL CHEMICAL RADIATION

If CBRN exposure is suspected, all filter media should be handled by personnel wearing protective equipment. Consult your unit CBRN Officer and CBRN NCO for appropriate handling or disposal procedures.

1. Disconnect applicator module battery.
   a. Unclip negative terminal protective cover.
   b. Remove negative terminal connector from battery.
2. Loosen but do not remove front left engine mounting bolt and nut (Figure 1, Item 1).
3. Remove remaining three engine mounting bolts, washers and nuts.

NOTE

Engine may need to be lifted slightly to access spacer (Figure 1, Item 2).

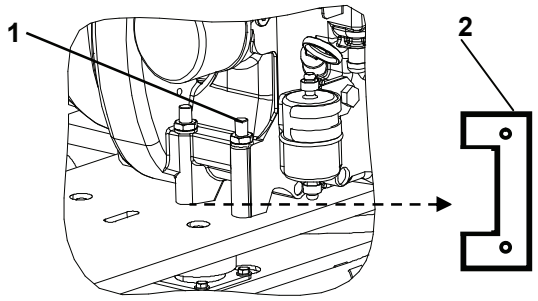


Figure 1. Engine Bolts – Engine Left Side.

AIR FILTER ASSEMBLY REMOVAL - CONTINUED

4. Remove spacer (Figure 1, Item 2), located underneath engine, and retain for re-installation.
5. Remove screw, flat and lock washers and nut (Figure 2, Item 2) securing exhaust pipe (Figure 2, Item 1) to burner.

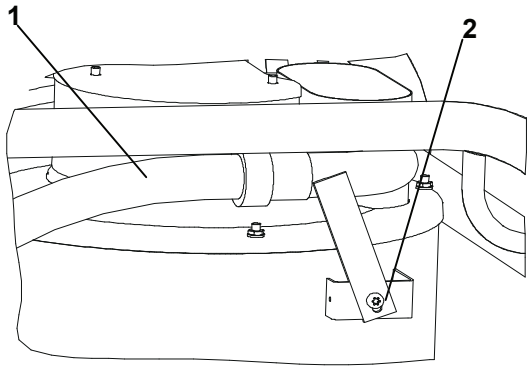


Figure 2. Exhaust Pipe - Removal.

6. Rotate engine clockwise away from burner.
7. Remove two hex-nuts (Figure 3, Item 1).
8. Grasp air filter assembly (Figure 3, Item 2) around center housing, pull air filter off studs (Figure 3, Items 3).

NOTE

If either stud (Figure 3, Item 3) is bent or damaged, replace engine (WP 0050).

9. Remove gasket (Figure 3, Item 4). Inspect studs (Figure 3, Item 3) for damage.

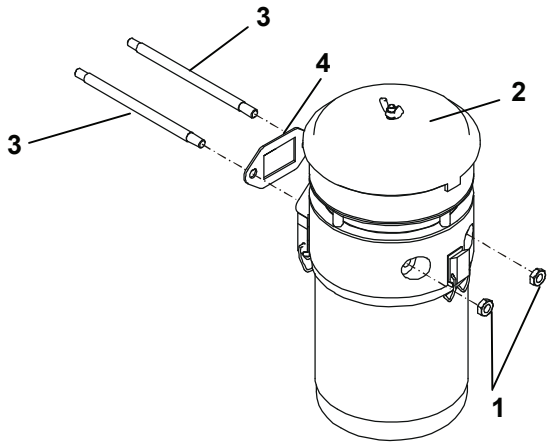


Figure 3. Air Filter Assembly - Removal.

END OF TASK

AIR FILTER ASSEMBLY CLEANING

WARNING

Dry cleaning solvent is moderately toxic to the skin, eyes and respiratory tract; avoid prolonged exposure. Skin and eye protection is required. Good ventilation is required. Do not use near open flame or excessive heat. Flash point is 200 °F (93.3 °C).

1. Ensure that all gasket material is removed from both mounting flange of housing and mounting flange on cylinder head.
2. Clean all metal parts in dry cleaning solvent and dry thoroughly.

END OF TASK

AIR FILTER ASSEMBLY INSTALLATION

1. Install gasket (Figure 4, Item 4) on studs and seat next to intake flange of cylinder head.
2. Install air filter (Figure 4, Item 2) onto studs (Figure 4, Item 3) and seat firmly against gaskets (Figure 4, Item 4).
3. Secure air filter (Figure 4, Item 2) with two hex-nuts (Figure 4, Item 1) and tighten nuts securely.

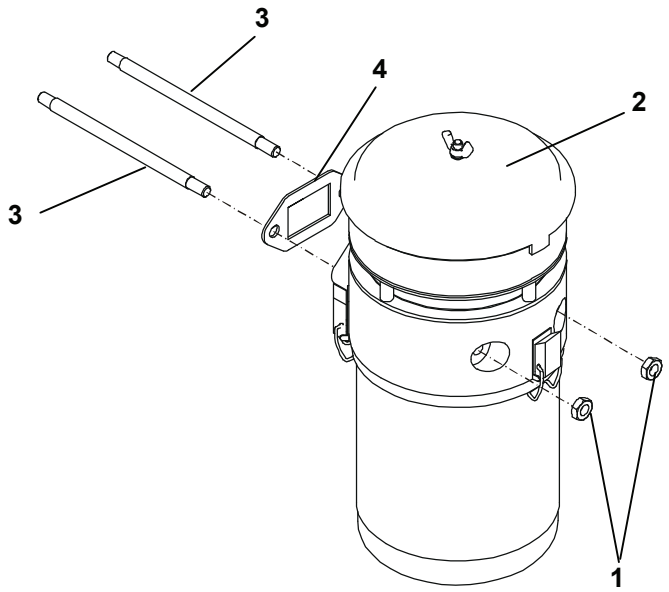


Figure 4. Air Filter Assembly - Installation.

4. Rotate engine into position.
5. Reinstall and align spacers (Figure 1, Item 2).
6. Reinstall three bolts and tighten all engine mounting bolts, washers and nuts (Figure 1, Item 1).

AIR FILTER ASSEMBLY INSTALLATION - CONTINUED

7. Reinstall screw, flat and lock washer, and nut (Figure 2, Item 2) to secure exhaust pipe (Figure 2, Item 1) to burner.
8. Reinstall V-belt (WP 0011).
9. Connect battery.
    a. Attach negative terminal connector.
    b. Close terminal protective cover.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
FUEL FILTER REPLACEMENT

INITIAL SETUP:

Test Equipment
Not Applicable

Tools
Tool Kit, General Mechanic (WP 0082, Item 2)

Materials/Parts
Filter, Fluid (WP 0075, Item 2)
Clamp, Hose (2) (WP 0075, Item 4)
Pan, Drain (WP 0083, Item 8)
Cloth, Cleaning (WP 0083, Item 3)

Personnel Required
Equipment Repairer/Mechanic

References
TM 3-4230-238-10

Equipment Condition
Engine off and cool

REMOVAL

WARNING

CHEMICAL EYE PROTECTION VAPOR FIRE EXPLOSION

Spilled fuel on a hot engine can ignite, causing damage to equipment and possible personal injury. Allow engine to cool before draining fuel from unit.

1. Turn off emergency fuel shutoff valve (Figure 1, Item 1).

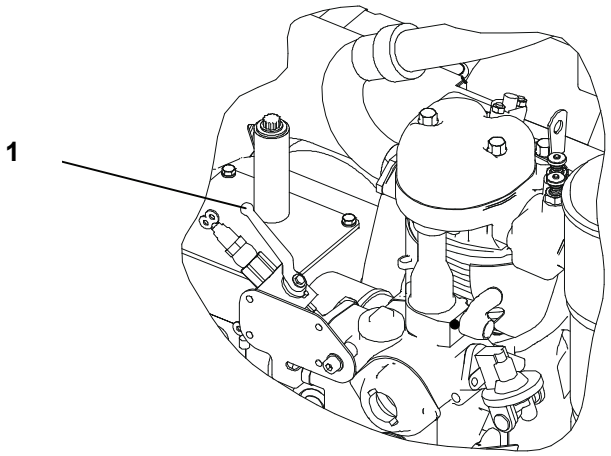


Figure 1. Emergency Fuel Shutoff Valve.

2. Loosen clamps (Figure 2, Items 1 and 2) to relieve compression on fuel lines.
3. Loosen band clamp on fuel filter (Figure 2, Item 6).

REMOVAL - CONTINUED

4. Close off fuel line (Figure 2, Item 3) near clamp (Figure 2, Item 1) to prevent spillage of fuel without damaging fuel line.
5. With drain pan in place, remove fuel lines (Figure 2, Items 3 and 4) from inlet and outlet of fuel filter (Figure 2, Item 5).
6. Remove fuel filter from engine, and dispose of in accordance with local OP.

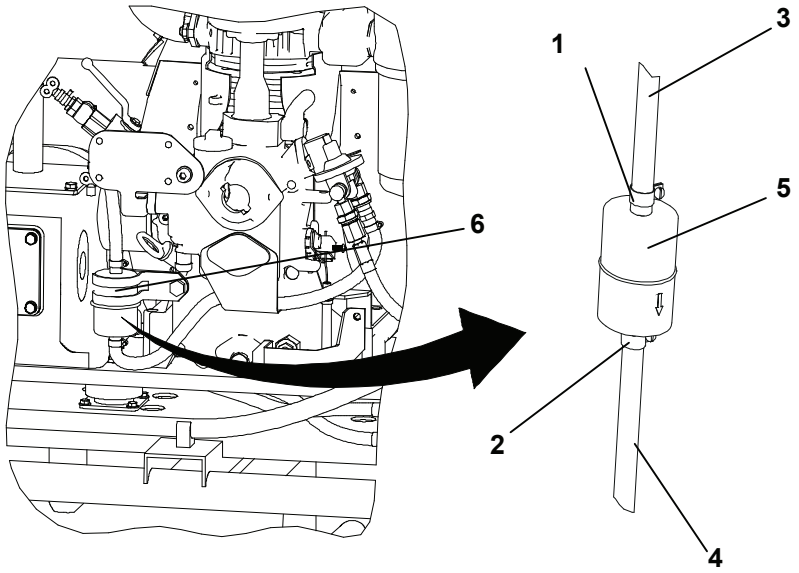


Figure 2. Fuel Filter Assembly.

END OF TASK

INSTALLATION

NOTE

Arrow on fuel filter points to inlet.

1. Install new fuel filter (Figure 2, Item 5), noting direction of inlet arrow on side of fuel filter in order to orient it correctly with respect to inlet and outlet.
2. Insert inlet of fuel filter into fuel line (Figure 2, Item 4) coming from fuel can.
3. Insert outlet of fuel filter into fuel line (Figure 2, Item 3) leading to fuel pump.
4. Seat fuel lines fully onto filter.
5. Tighten band clamp (Figure 2, Item 6) on fuel filter
6. Slide clamps (Figure 2, Item 1 and 2) over fuel lines and secure, compressing lines onto fuel filter.
7. Open emergency fuel shutoff valve (Figure 1, Item 1).
8. Start engine (Operator's Manual, WP 0007). Check for fuel leakage at fuel lines and clamps.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
BLEEDING FUEL SYSTEM

INITIAL SETUP:

Test Equipment
Not Applicable

Tools
Tool Kit, General Mechanic (WP 0082, Item 2)

Materials/Parts
Cloth, Cleaning (WP 0083, Item 3)
Pan, Drain (WP 0083, Item 8)

Personnel Required
Equipment Repairer/Mechanic

References
TM 3-4230-238-10

Equipment Condition
Engine stopped and cool
Fuel can with diesel/JP8 connected (WP 0005)

MECHANICALLY BLEEDING FUEL SYSTEM

WARNING

Spilled fuel on a hot engine can ignite, causing damage to equipment and possible personnel injury. Allow engine to cool before draining fuel from unit.

1. Set throttle lever to full throttle.
2. Open venting screw (Figure 1, Item 1) with attached key (Figure 1, Item 2).

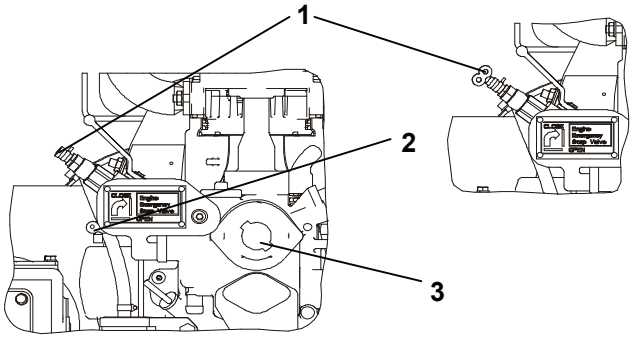


Figure 1. Fuel Line Assembly.

3. Set selector switch to start position.
4. Press starter button several times until fuel comes out of venting screw.

CAUTION

Hold the starter button pressed for a maximum of 20 seconds. Before each repeated pressing of the starter button, wait 30 seconds.

5. Tighten venting screw (Figure 1, Item 1).

END OF TASK

MANUALLY BLEED FUEL SYSTEM

1. Press decompression lever (Figure 2, Item 1) in toward front of applicator module until lever is flush with valve (ten o'clock position).
2. Set throttle lever to full throttle.

NOTE

Use a drain pan to catch the fuel as it is bled from the venting screw.

3. Open venting screw (Figure 1, Item 1) with attached key (Figure 1, Item 2)

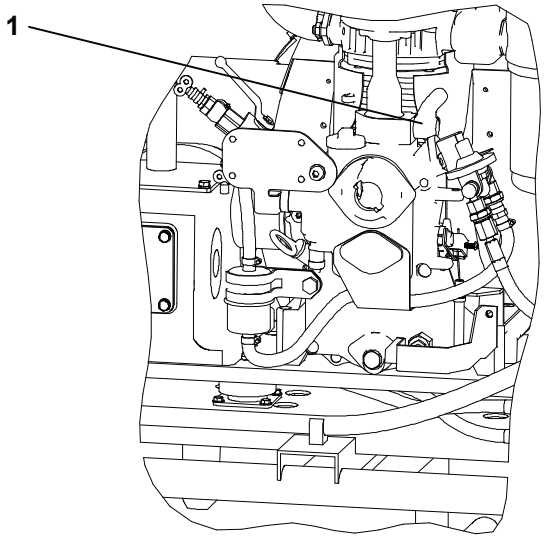


Figure 2. Engine.

4. Insert hand crank into cranking support bearing (Figure 1, Item 3) and turn crank to the right until fuel emerges from venting screw.
5. Tighten venting screw (Figure 1, Item 1).
6. Press in on decompression lever (Figure 2, Item 1) and turn lever to right toward center of applicator module until it clicks to second position (one o'clock position) and stops.
7. Start engine (Operator's Manual, WP 0007), run for two minutes and shutdown engine (Operator's Manual, WP 0013).

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
ENGINE VALVE COVER AND GASKET REPLACEMENT

INITIAL SETUP:

Test Equipment
Not Applicable

Tools
Tool Kit, General Mechanic (WP 0082, Item 2)

Materials/Parts
Rocker Cover (WP 0075, Item 15)
Gasket (WP 0075, Item 16)
Washer, Flat (2) (WP 0075, Item 14)
Cloth, Cleaning (WP 0083, Item 3)

Personnel Required
Equipment Repairer/Mechanic

References
WP 0064

Equipment Condition
Applicator module set on level ground
Engine off and cool

REMOVAL

1. Remove engine exhaust pipe (WP 0064).
2. Remove two hex-nuts (Figure 1, Item 1), fuel line clamp (Figure 1 Item 5) and flat washers (Figure 1, Item 2).
3. Remove cover (Figure 1, Item 3) and gasket (Figure 1, Item 4). Discard gasket.

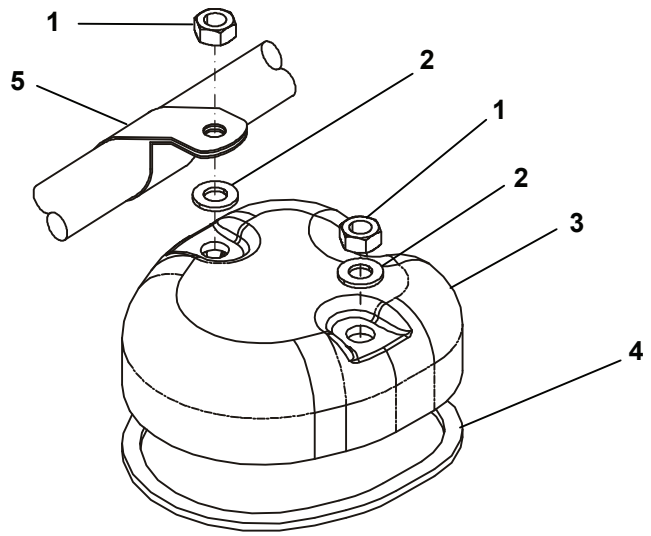


Figure 1. Valve Cover Assembly – Removal

END OF TASK

INSTALLATION

1. Install new gasket (Figure 2, Item 4) to sealing face of cylinder head.
2. Install new cover (Figure 2, Item 3) over studs and seat onto gasket (Figure 2, Item 4), being careful not to move gasket off sealing face of cylinder head.
3. Secure cover (Figure 2, Item 3) with two new flat washers (Figure 2, Item 2), fuel line clamp (Figure 2 Item 5) and hex-nuts (Figure 2, Item 1).
4. Reinstall engine exhaust pipe (WP 0064).

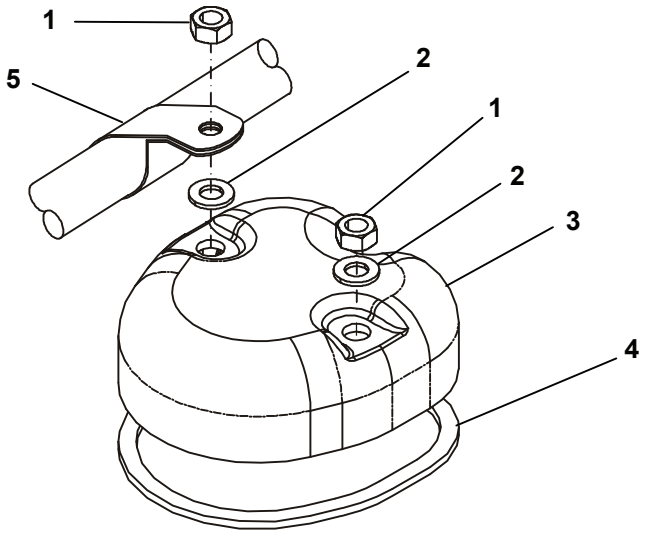


Figure 2. Valve Cover Assembly - Installation.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
ENGINE VALVE CLEARANCE CHECK AND ADJUSTMENT

INITIAL SETUP:

Test Equipment
Not Applicable

Tools
Tool Kit, General Mechanic (WP 0082, Item 2)

Materials/Parts
Gasket (WP 0075, Item 16)
Washer, Flat (2) (WP 0075, Item 14)
Cloth, Cleaning (WP 0083, Item 3)
Solvent, Cleaning (WP 0083, Item 10)

Personnel Required
Equipment Repairer/Mechanic

References
WP 0056
WP 0064

Equipment Condition
Applicator module set on level ground
Engine off and cool

ADJUSTING ENGINE VALVE CLEARANCE

WARNING

CHEMICAL EYE PROTECTION VAPOR FIRE EXPLOSION

Fuel fumes are highly flammable and will cause serious injuries or death. Wear protective clothing, protective rubber gloves and chemical splash goggles.

1. Remove engine exhaust pipe (WP 0064).
2. Remove engine valve cover (WP 0056).
3. The decompression valve must be in the nine o'clock position (Figure 1, Item 1). Cam pin (Figure 1, Item 3) under decompression lever points to the front.
4. Insert hand crank into cranking support bearing (Figure 1, Item 2) and turn clockwise until compression resistance can be felt. Observe that intake and exhaust valves are closed.

ADJUSTING ENGINE VALVE CLEARANCE - CONTINUED

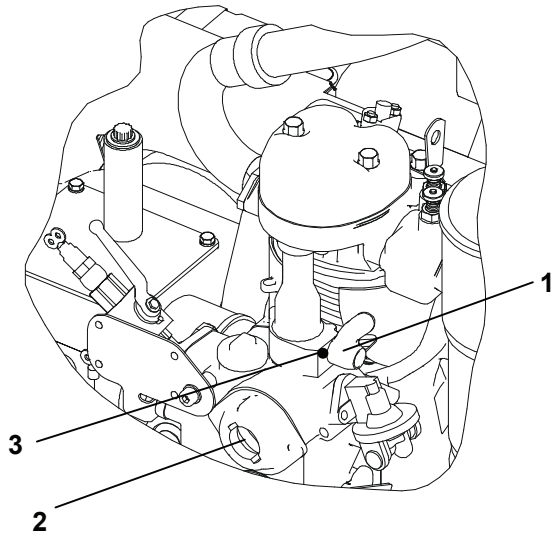


Figure 1. Engine Valve Cover.

5. With 0.004 in. (0.1 mm) feeler gage (Figure 2, Item 5), check both engine valves for clearance between rocker arm (Figure 2, Item 2) and valve stem (Figure 2, Item 4). Light resistance should be felt when feeler gauge is slid between rocker arm and valve stem.

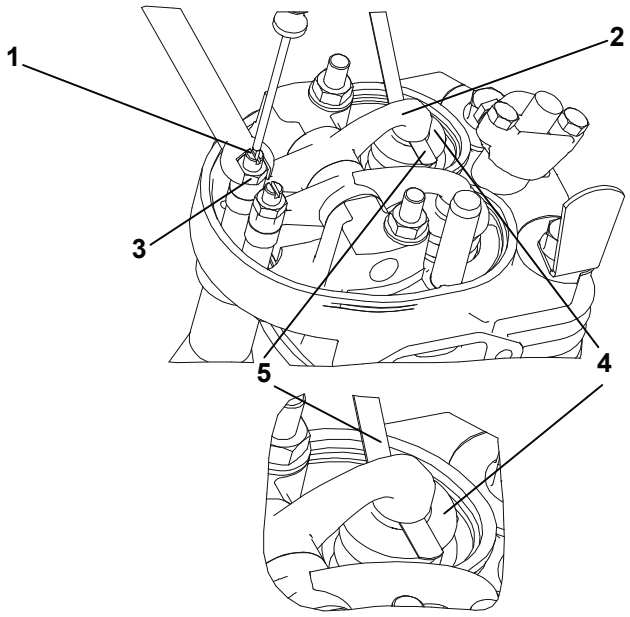


Figure 2. Valve Assembly.

ADJUSTING ENGINE VALVE CLEARANCE - CONTINUED

6. If valve clearance is incorrect, perform the following:
    a. Loosen hex-nut (Figure 2, Item 3).
    b. Turn adjustment screw (Figure 2, Item 1) left to increase valve clearance, or right to decrease it.
    c. Tighten hex-nut (Figure 2, Item 3).
7. Engage decompression valve and check valve clearance again with a 0.004 in. (0.1 mm) feeler gage. Repeat this step until valve clearance of 0.004 in (0.1 mm) is reached.
8. With engine hand crank, rotate engine through cycle of revolutions to disengage decompression valve (8 full rotations). Engine rotation should have no resistance (free wheeling or no load).
9. Re-install engine valve cover (WP 0056).
10. Install engine exhaust pipe (WP 0064).

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
ENGINE COOLING FINS CLEANING

INITIAL SETUP:

Test Equipment
Not Applicable

Personnel Required
Equipment Repairer/Mechanic

Tools
Tool Kit, General Mechanic (WP 0082, Item 2)
Compressed Air Source

References
TM 3-4230-238-10

Materials/Parts
Solvent, Cleaning (WP 0083, Item 10)
Cloth, Cleaning (WP 0083, Item 3)

Equipment Condition
Applicator module set on level ground
Engine off and cool

CLEANING ENGINE COOLING FINS

WARNING

EYE PROTECTION

When using compressed air, always wear eye protection and direct away from eyes and skin. Compressed air must never be aimed at anyone as it can cause serious injury.

1. Dry dirt:
   a. Clean cooling fins (Figure 1, Item 1) on cylinder head, cylinder and oil cooler (on crank case) as well as blower blades, using a brush.
   b. Blow out remaining dirt with compressed air.

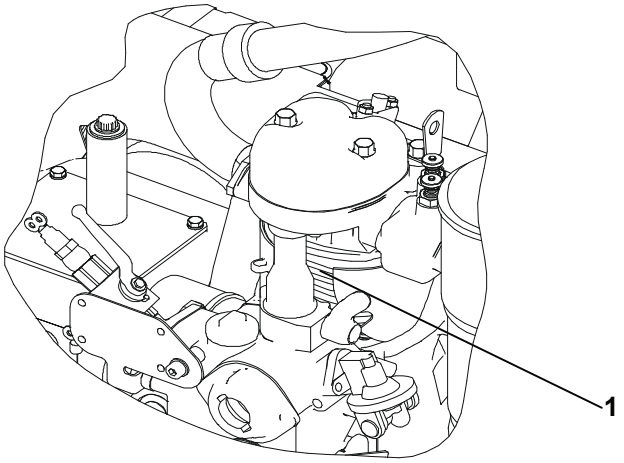


Figure 1. Engine Cooling Fins.

CLEANING ENGINE COOLING FINS - CONTINUED

2. Oily dirt:
   a. Clean air guide housing, cylinder head, cylinder and oil cooler, using brush.
   b. Spray cooling fins with strong stream of water.
   c. Blow dry cooling fins with compressed air.
   d. Run engine until warm (Operator's Manual, WP 0007).

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
ENGINE FUEL PUMP REPLACEMENT

INITIAL SETUP:

Test Equipment
Not Applicable

Tools
Tool Kit, General Mechanic (WP 0082, Item 2)

Materials/Parts
Fuel Pump (WP 0075, Item 51)
Gasket (WP 0075, Item 50)
Copper Gasket (4) (WP 0075, Item 55)
Washer, Spring Tension (2) (WP 0075, Item 52)
Pan, Drain (WP 0083, Item 8)
Cloth, Cleaning (WP 0083, Item 3)
Strap, Tiedown Electrical (WP 0083, Item 11)

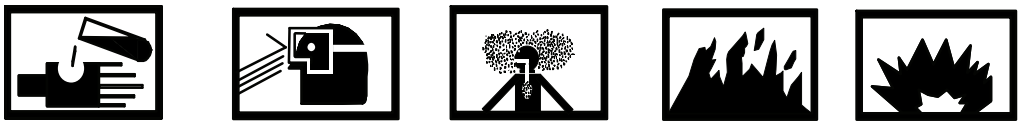
Personnel Required
Equipment Repairer/Mechanic

References
TM 3-4230-238-10

Equipment Condition
Applicator module set on level ground
Engine off and cool

REMOVAL

WARNING



CHEMICAL EYE PROTECTION VAPOR FIRE EXPLOSION

Fuel is highly flammable and will cause serious injuries or death. Never smoke or have open flames within 50 feet (15 m) of the applicator module. Avoid fuel spills. Wear protective clothing, protective rubber gloves and chemical splash goggles.

NOTE

Ensure fuel can is not connected before disconnecting fuel lines.

1. Position drain pan under fuel pump.

REMOVAL - CONTINUED

2. Remove hex bolt, two copper washers, and fuel line fitting (Figure 1, Item 1) from outboard side of fuel pump. Drain fuel into drain pan.

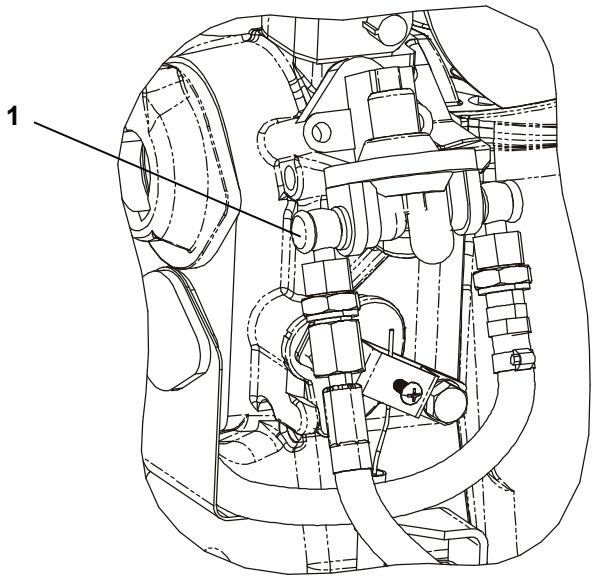


Figure 1. Fuel Pump – Outboard Side.

3. Remove air filter assembly cup as follows:
   a. Release two retaining clips (Figure 2, Item 1).
   b. Remove air filter assembly cup (Figure 2, Item 3) from housing (Figure 2, Item 2).

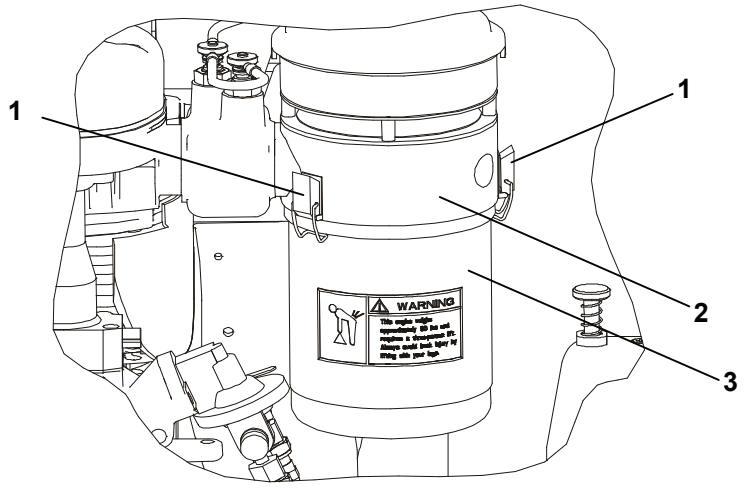


Figure 2. Engine Air Filter Canister.

REMOVAL - CONTINUED

4. Remove hex bolt, two copper washers, and fuel line fitting (Figure 3, Item 3) from inboard side of fuel pump. Drain fuel into drain pan.
5. Remove two hex nuts and lock washers (Figure 3, Item 1) from fuel pump mount studs. To gain access to inboard second hex nut, lift up and hold fuel pump primer handle (Figure 3, Item 2).
6. Remove and discard old fuel pump gasket.

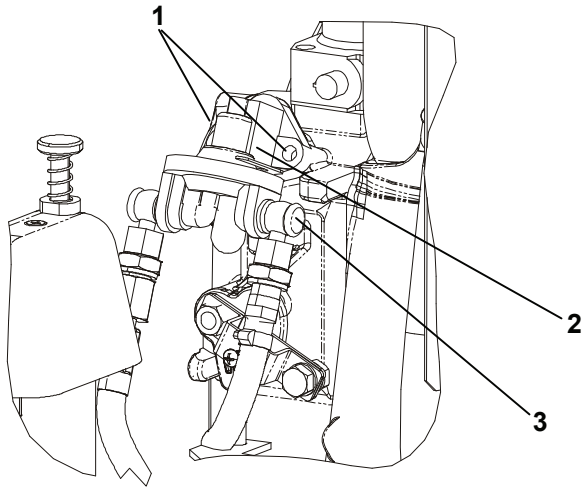


Figure 3. Fuel Pump – Inboard Side.

END OF TASK

INSTALLATION

1. Clean engine fuel pump mounting surface.
2. Install fuel pump gasket and fuel pump onto engine. Use two threaded mounting studs as guide.
3. Install new lock washer and hex nut onto each mounting stud. To gain access to inboard second hex nut, lift up and hold fuel pump primer handle (Figure 3, Item 2). Tighten nuts.

NOTE

One copper washer must be located on each side of the fuel line fittings, both inward and outward fittings.

4. Attach inboard fuel line fitting, copper washers, and hex bolt. Align fitting to mounting angle of fuel pump (5 o'clock position) and install as follows:
   a. Install thicker washer (Figure 4, Item 2) on hex bolt (Figure 4, Item 1).
   b. Install fuel line fitting (Figure 4, Item 3) on top of thicker washer (Figure 4, Item 2).
   c. Install thinner washer (Figure 4, Item 4) on top of fuel line fitting (Figure 4, Item 3).
   d. Attach to fuel pump. Tighten.

INSTALLATION-CONTINUED

5. Attach outboard fuel line fitting, copper washers, and hex bolt. Align fitting to mounting angle of fuel pump (5 o'clock position) and install as follows:
   a. Install thicker washer (Figure 4, Item 2) on hex bolt (Figure 4, Item 1).
   b. Install fuel line fitting (Figure 4, Item 3) on top of thicker washer (Figure 4, Item 2).
   c. Install thinner washer (Figure 4, Item 4) on top of fuel line fitting (Figure 4, Item 3).
   d. Attach to fuel pump. Tighten.

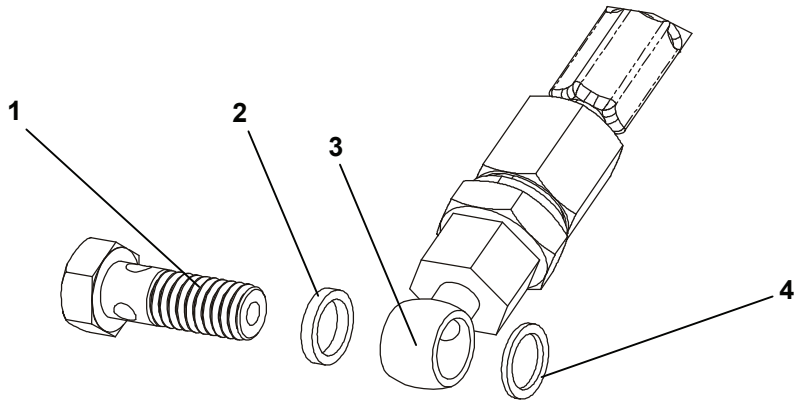


Figure 4. Fuel Line Fitting Assembly.

6. Re-install air filter assembly cup as follows:
   a. Install air filter assembly cup (Figure 5, Item 3) to housing (Figure 5, Item 2).
   b. Engage two retaining clips (Figure 5, Item 1).
7. Start engine (Operator's Manual, WP 0007). Check for leaks.

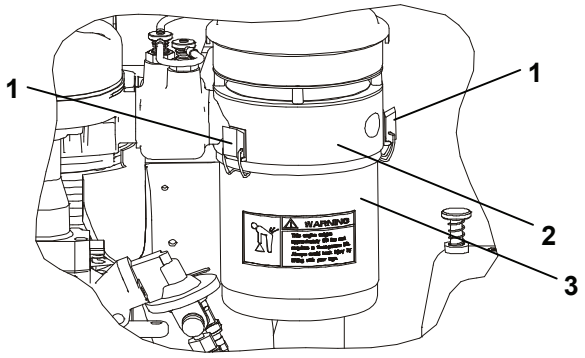


Figure 5. Engine Air Filter Canister.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
STARTER TEST AND REPLACEMENT

INITIAL SETUP:

Test Equipment
Volt/Ohm Meter (WP 0082, Item 3)

Personnel Required
Equipment Repairer/Mechanic (2)

Tools
Tool Kit, General Mechanic (WP 0082, Item 2)

References
WP 0025
WP 0028

Materials/Parts
Starter, Motor (WP 0075, Item 7)
Washer, Spring Tension (2) (WP 0075, Item 9)

Equipment Condition
Applicator module set on level ground
Fuel can removed
Engine off and cool

TEST

WARNING

ELECTRICAL **EYE PROTECTION**

Use caution when performing maintenance on electrical components to prevent shock. Shock will cause injuries or death. Always wear eye protection and protective gloves.

1. Check battery terminal connections to ensure terminal connectors are tight.
2. Test battery (WP 0025).
3. Check main power connection (Figure 1, Item 2) at starter solenoid to ensure connection is tight.

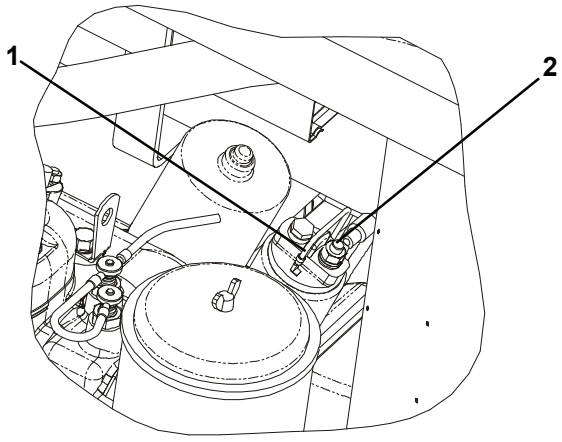


Figure 1. Starter – Test.

TEST - CONTINUED

4. Using Volt/Ohm meter, check voltage at main power connection (Figure 1, Item 2) at starter solenoid. Battery voltage of 12.5 or higher should be present.
5. Check the starter solenoid wire (small wire with quick disconnect) (Figure 1, Item 1) at starter solenoid connection. Ensure solenoid wire is connected. If not connected, connect solenoid wire to the starter solenoid.
6. Set selector switch to operating position. (Figure 2, Item 2)
7. Using Volt/Ohm meter, check for battery voltage at solenoid wire (Figure 1, Item 1). If no voltage is present, replace starter fuse (WP 0028).
8. If fuse is not defective, replace starter (Removal task in this WP).
9. Return selector switch to off position (Figure 2, Item 1).

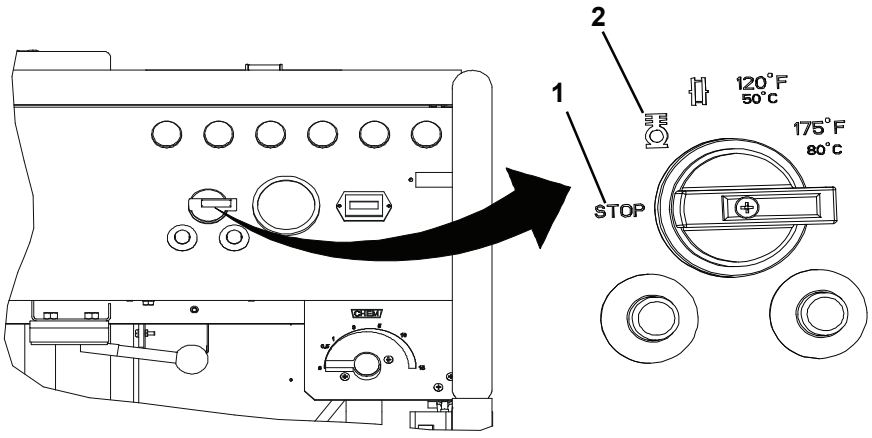


Figure 2. Selector Switch.

END OF TASK

REMOVAL

WARNING

ELECTRICAL CHEMICAL EYE PROTECTION

Always disconnect battery cables before performing maintenance to prevent electrical shock which could cause injury or death.. Always wear eye protection and protective gloves when handling the battery.

1. Disconnect battery.
   a. Unclip negative terminal protective cover.
   b. Remove negative terminal connector from battery.
2. Remove solenoid wire (Figure 3, Item 1) and power cable (Figure 3, Item 2) from starter.
3. Remove nuts (Figure 3, Item 3) and lock washers (Figure 3, Item 4) securing starter to engine. Discard lock washers.
4. Remove starter from engine, noting correct positioning of starter (Figure 3).
5. Remove and retain gasket (Figure 3, Item 5).

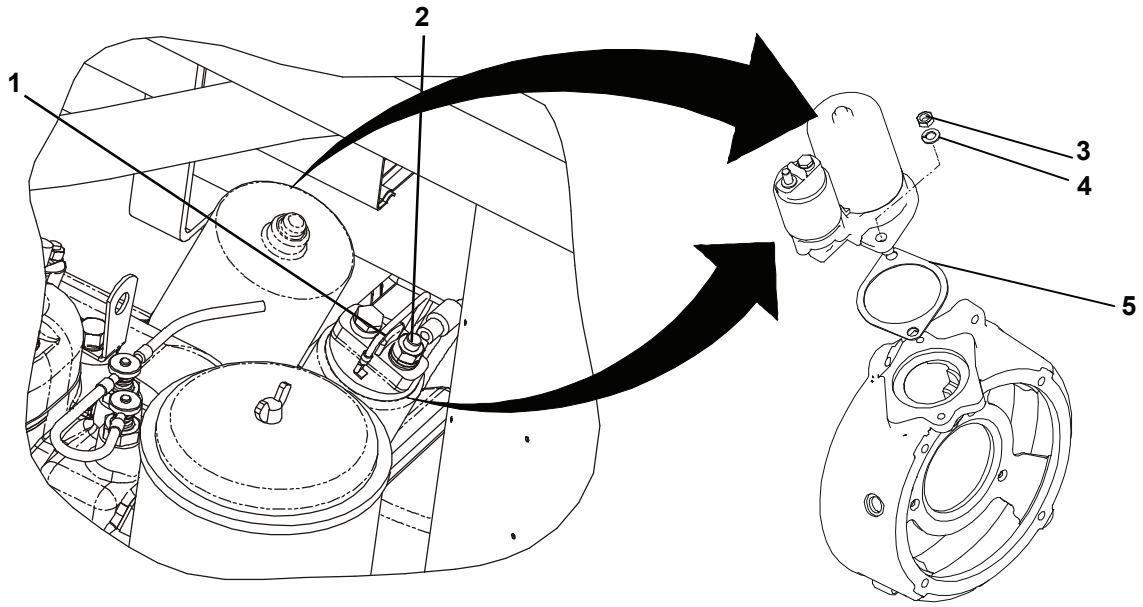


Figure 3. Starter – Removal.

END OF TASK

INSTALLATION

1. Install gasket (Figure 3, Item 5).
2. Position new starter (Figure 1, Item 2) on engine.
3. Install new lock washers (Figure 3, Item 4) and nuts (Figure 3, Item 3) to secure starter (Figure 1, Item 2) to engine.
4. Connect solenoid wire (Figure 3, Item 1) and power cable (Figure 3, Item 2) to starter solenoid.
5. Reconnect battery.
    a. Attach negative terminal connector.
    b. Close terminal protective cover.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
THROTTLE CONTROL ASSEMBLY INSPECTION AND REPLACEMENT

INITIAL SETUP:

Test Equipment
Not Applicable

Personnel Required
Equipment Repairer/Mechanic

Tools
Tool Kit, General Mechanic (WP 0082, Item 2)

References
TM 3-4230-238-10

Materials/Parts
Shaft, Drive Flexible (WP 0075, Item 105)
Lever, (WP 0075, Item 104)

Equipment Condition
Applicator module set on level ground
Engine off and cool

INSPECT

1. Move throttle lever from STOP position (Figure 1) to START position (Figure 2) several times (see Operator's Manual, WP 0007 for throttle lever positions).
2. Inspect for any binding of throttle lever cable and observe operation of throttle linkage (Figure 3, Item 1) on engine. Inspect throttle cable on engine linkage (Figure 3, Item 1) for fraying of cable.
3. Check throttle lever (Figure 1, Item 1) to see if throttle lever will move to the START and STOP positions without moving further in each direction. If throttle lever moves further in either direction, replace throttle lever assembly.
4. Check throttle linkage (Figure 3, Item 1) on engine when throttle lever is moved into STOP position (Figure 1). Ensure throttle linkage moves.
5. Start engine (Operator's Manual, WP 0007).
6. Place throttle lever (Figure 2, Item 1) in full throttle position (Figure 2). Check ease of throttle operation.
7. Place throttle lever in STOP position (Figure 1); engine should shut down. If engine does not shutdown, adjust control following installation step 7.

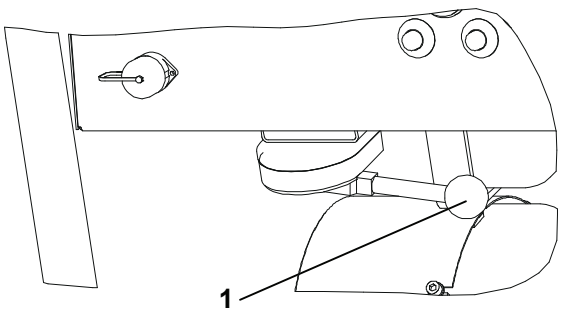


Figure 1. Throttle Control Assembly - Stop.

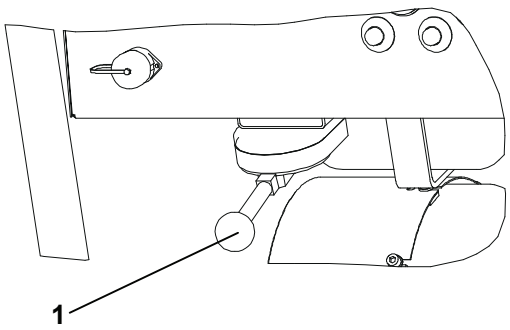


Figure 2. Throttle Control Assembly - Start.

INSPECT - CONTINUED

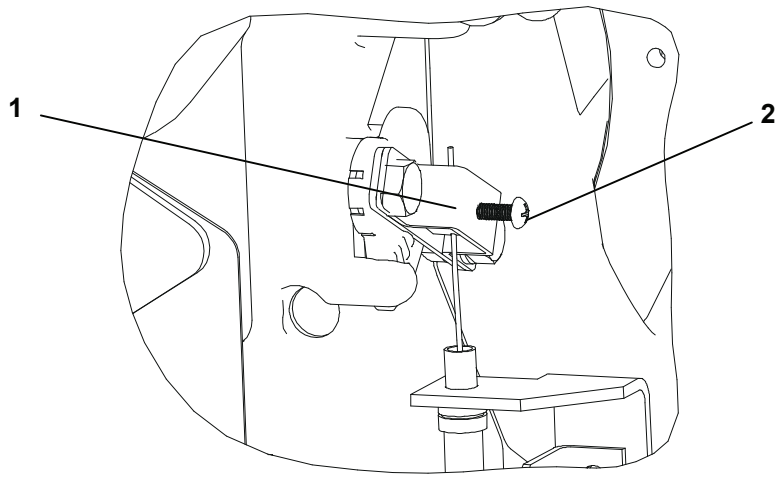


Figure 3. Engine – Inspect Cable.

END OF TASK

REMOVAL

1. Loosen throttle cable setscrew (Figure 3, Item 2) on throttle linkage attached to engine.
2. Loosen but do not remove two hex-head setscrews (Figure 4, Item 1).
3. Slowly pull cable from engine linkage end (Figure 5, Item 1) and out of throttle cable sleeve Figure 5, Item 2).
4. Inspect cable; if frayed or damaged, replace.

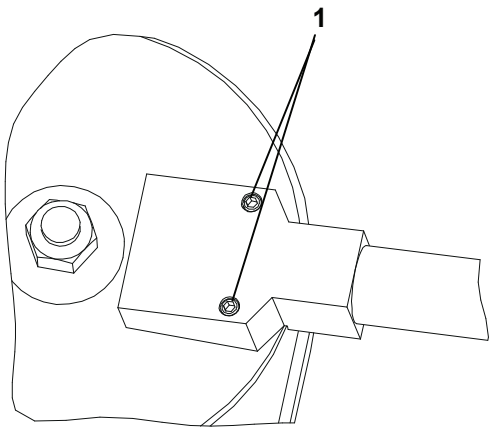


Figure 4. Throttle Control Handle.

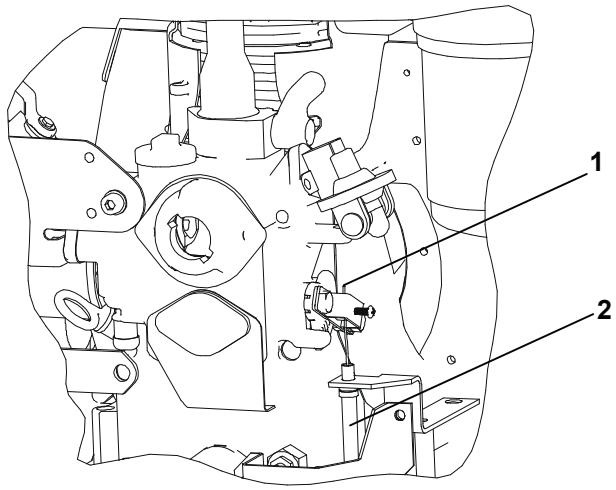


Figure 5. Engine - Removal.

END OF TASK

INSTALLATION

1. Feed cable thru engine linkage and bracket assembly (Figure 5, Item 1).

2. Lightly grease cable and insert non-retaining ball end into throttle cable sleeve (Figure 5 Item 2). There may be some binding of the cable.

3. Pull back slightly and insert cable into cable housing (Figure 6, Item 2) until it comes out of throttle handle bracket (Figure 6, Item 1).

4. Prior to securing the cable, ensure throttle and engine throttle linkages are in the positions as noted in the inspection steps.

5. Tighten two hex-head setscrews (Figure 4, Item 1) and throttle cable setscrew (Figure 3, Item 2).

6. Check for smooth operation of throttle and observe engine linkage.

7. Start engine and check to see it reaches operating speed and if throttle lever can shut engine down in STOP position. If not, tighten set screw (Figure 3, Item 2) while lever is in STOP position.

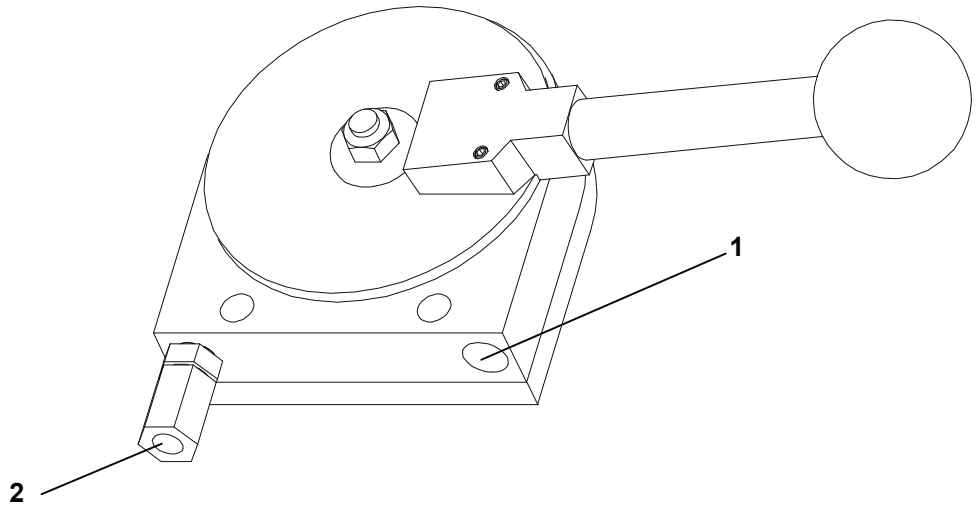


Figure 6. Throttle Control Assembly.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
MAIN FUEL SUPPLY LINE REPLACEMENT

INITIAL SETUP:

Test Equipment
Not Applicable

Tools
Tool Kit, General Mechanic (WP 0082, Item 2)

Materials/Parts
Hose Assy, Nonmetalic (3) (WP 0073, Item 2)
Clamp, Loop (4) (WP 0073, Item 21)
Strap, Tiedown electrical (WP 0083, Item 11)
Tags, Marking (WP 0083, Item 12)
Pan, Drain (WP 0083, Item 8)

Personnel Required
Equipment Repairer/Mechanic

References
TM 3-4230-238-10
WP 0055

Equipment Condition
Engine off and cool

REMOVAL

WARNING

CHEMICAL EYE PROTECTION VAPOR FIRE EXPLOSION

Fuel is highly flammable and will cause serious injuries or death. Never smoke or have open flames within 50 feet (15 m) of the applicator module. Avoid fuel spills. Wear protective clothing, protective rubber gloves and chemical splash goggles.

NOTE

Fourth clamp is located at top of applicator module next to calcium inhibitor container.

1. Remove four bolts (Figure 1, Item 1) from fuel line mounting clamps (Figure1, Item 2).
2. Remove four fuel line mounting clamps (Figure 1, Item 2).

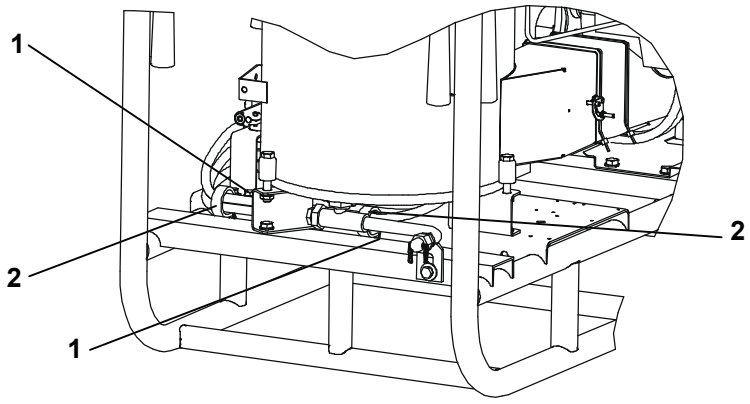


Figure 1. Fuel Line Assembly.

REMOVAL - CONTINUED

3. Tag three fuel lines (Figure 2, Item 1) and fuel line fittings (Figure 2, Item 2) on fuel cap (Figure 2, Item 3).
4. Cut cable ties then remove three fuel lines (Figure 2, Item 1) from fuel cap (Figure 2, Item 3). Catch residual fuel in drain pan.

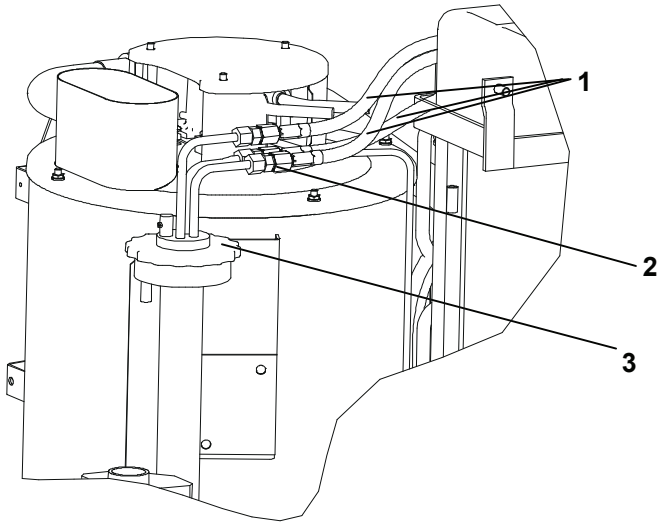


Figure 2. Fuel Cap Assembly - Removal.

5. Tag three fuel lines (Figure 3, Item 2) and fuel line fittings (Figure 3, Item 1) on fuel block assembly (Figure 3, Item 3).
6. Cut cable ties then remove three fuel lines (Figure 3, Item 2) from fuel block assembly (Figure 3, Item 3).

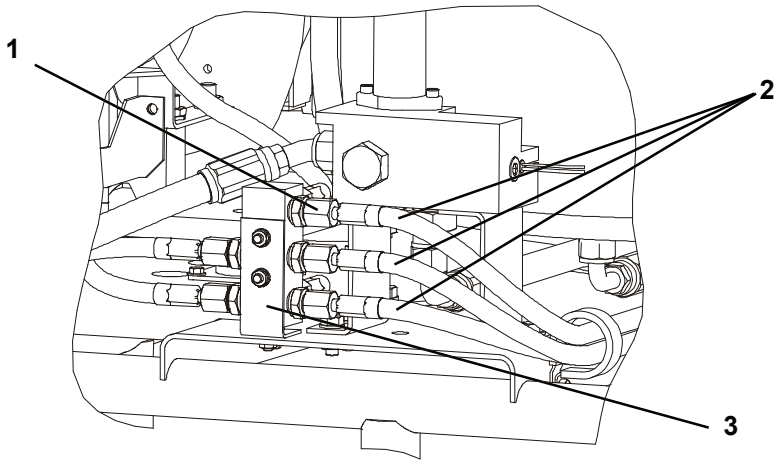


Figure 3. Fuel Line- Removal.

END OF TASK

INSTALLATION

1. Replace three fuel lines (Figure 4, Item 1) to fuel block assembly (Figure 4, Item 2). Secure with cable ties. Remove wire tags.
2. Replace three fuel lines (Figure 5, Item 1) to fuel cap (Figure 5, Item 2) Secure with cable ties. Remove wire tags.
3. Bleed fuel lines (WP 0055).
4. Reinstall four fuel line mounting clamps (Figure 1, Item 2).
5. Reinstall four bolts (Figure 1, Item 1) from fuel line mounting clamps (Figure1, Item 2).
6. Start engine (Operator's Manual, WP 0007) and check for proper operation and fuel leaks.
7. Shutdown engine (Operator's Manual, WP 0013).

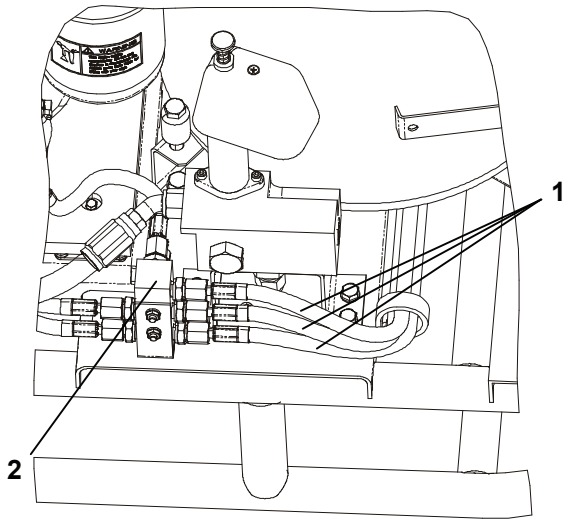


Figure 4. Fuel Line - Installation.

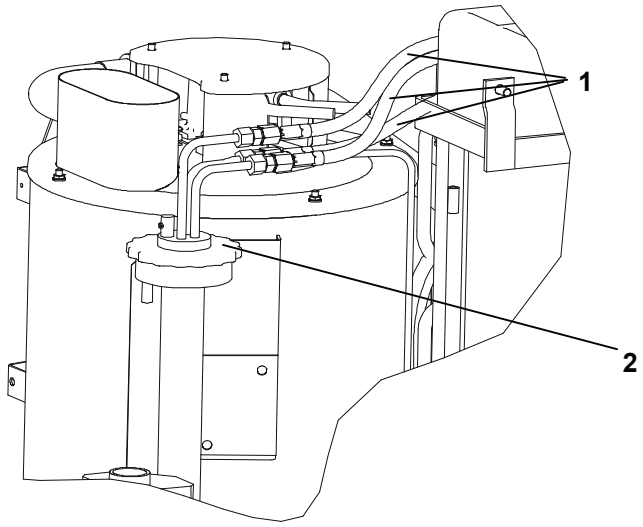


Figure 5. Fuel Cap Assembly - Installation.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
EMERGENCY FUEL SHUTOFF VALVE REPLACEMENT

INITIAL SETUP:

Test Equipment
Not Applicable

Tools
Tool Kit, General Mechanic (WP 0082, Item 2)

Materials/Parts
Shut off Valve (WP 0075, Item 35)
Gasket (WP 0075, Items 33 and 34)
Washer Lock (WP 0075, Item 30)
Cloth, Cleaning (WP 0083, Item 3)
Pan, Drain (WP 0083, Item 8)

Personnel Required
Equipment Repairer/Mechanic

References
TM 3-4230-238-10

Equipment Condition
Engine off and cool

REMOVAL

WARNING

CHEMICAL **EYE PROTECTION** **VAPOR** **FIRE** **EXPLOSION**

Fuel is highly flammable and will cause serious injuries or death. Never smoke or have open flames within 50 feet (15 m) of the applicator module. Avoid fuel spills.

Wear protective clothing, protective rubber gloves and chemical splash goggles. Chemical splash goggles are essential when performing this task.

1. Remove dirt or debris from around emergency fuel shutoff valve (Figure 1, Item 2).
2. Remove bolt (Figure 1, Item 5) and flat washer (Figure 1, Item 4), from emergency fuel shutoff valve data plate (Figure 1, Item 3).
3. Remove nut and lock washer (Figure 1, Item 6) from bottom of emergency fuel shutoff valve data plate (Figure 1, Item 3). Catch residual fuel in drain pan. Discard lock washer (Figure 1, Item 6).
4. Loosen and remove banjo bolt (Figure 1, Item 1) on top of emergency fuel shutoff valve (Figure 1, Item 2). Discard copper washer (Figure 1, Item 7).
5. Remove key from emergency fuel shutoff valve and retain.
6. Loosen and remove emergency fuel shutoff valve (Figure 2, Item 1) from injection pump (Figure 2, Item 3) by turning it counterclockwise. Catch residual fuel with drip pan.
7. Discard defective emergency fuel shutoff valve (Figure 2, Item 1) and copper gasket (Figure 2, Item 2).

REMOVAL - CONTINUED

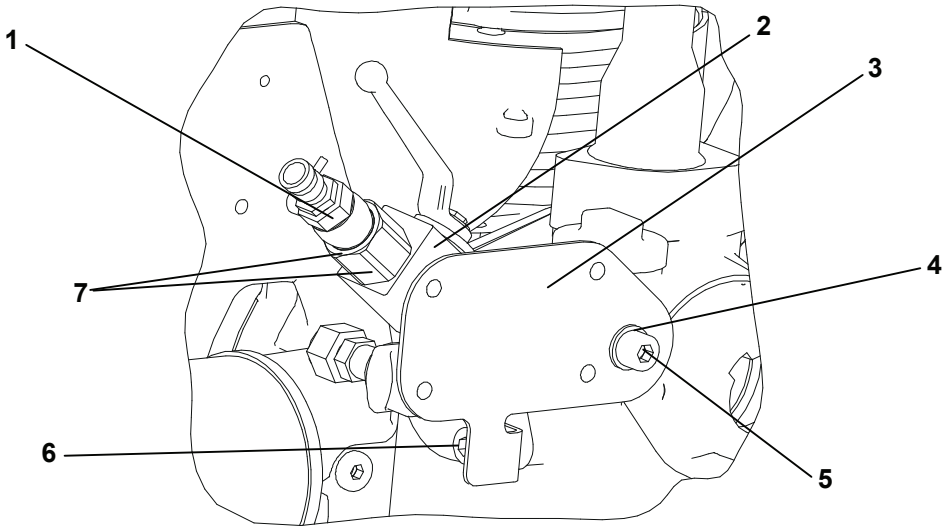


Figure 1. Emergency Fuel Shutoff Valve – Removal.

END OF TASK

INSTALLATION

CAUTION

Excessive torque can damage the threads of emergency fuel shutoff valve. Tighten the threads of emergency fuel shutoff valve so the handle is in the upright position.

1. Install new copper washer (Figure 2, Item 2) and install the emergency fuel shutoff valve (Figure 2, Item 1) into injection pump (Figure 2, Item 3) by turning it clockwise.

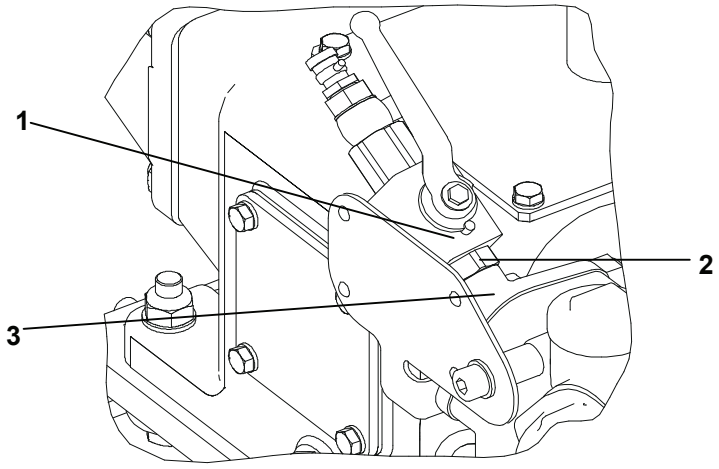


Figure 2. Emergency Fuel Shutoff Valve – Installation.

INSTALLATION - CONTINUED

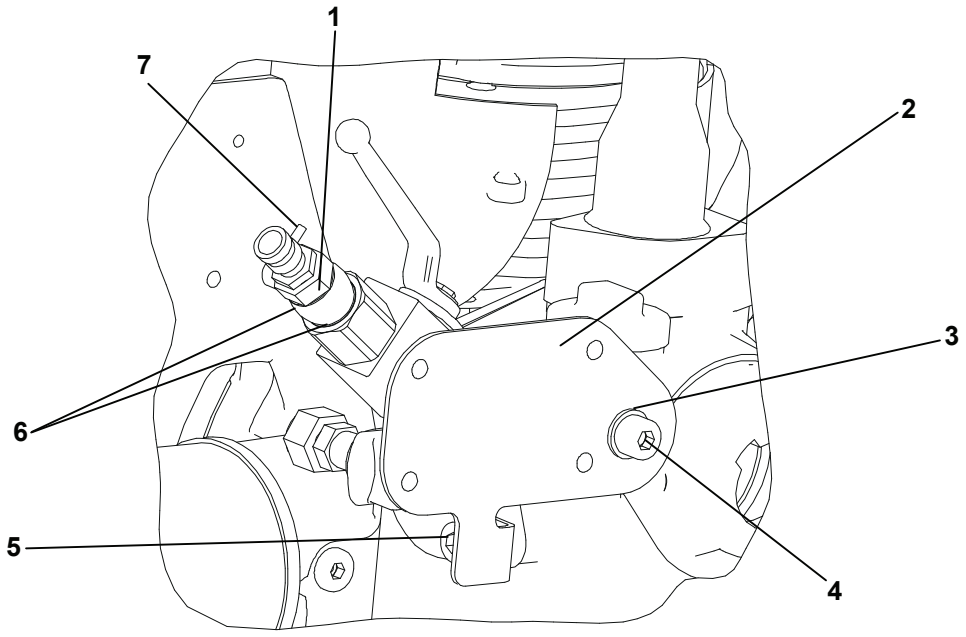


Figure 3. Emergency Fuel Shutoff Valve – Installation.

2. Install banjo bolt:
   a. Slide copper washer (Figure 3, Item 6) onto the banjo bolt (Figure 3, Item 1) through banjo fitting.
   b. Place another copper washer (Figure 3, Item 6) onto banjo bolt (Figure 3, Item 1) as it comes through banjo fitting.
   c. Reinstall emergency fuel shutoff valve key.
   d. Install banjo bolt (Figure 3, Item 1) and fitting onto shutoff valve turning clockwise.
   e. Secure banjo bolt (Figure 3, Item 1) with the fuel bleed-off (Figure 3, Item 7) facing up.
3. Install bolt (Figure 3, Item 4) and flat washer (Figure 3, Item 3), to emergency fuel shutoff valve data plate (Figure 1, Item 2).
4. Install nut and washer (Figure 3, Item 5) to bottom of emergency fuel shutoff valve data plate (Figure 3, Item 2).
5. Start engine (Operator's Manual, WP 0007) and check for leaks.
6. Shutdown engine after check (Operator's Manual, WP 0013).

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
EXHAUST PIPE REPLACEMENT

INITIAL SETUP:

Test Equipment
Not Applicable

Tools
Tool Kit, General Mechanic (WP 0082, Item 2)
Bit, star head (WP 0082, Item 3)

Materials/Parts
Pipe, Exhaust (WP 0075, Item 63)
Gasket, (WP 0075, Item 71)
Washer, Lock (WP 0075, Item 65
Washer, Flat (2) (WP 0075, Item 73)
Accessory Kit, (WP 0082, Item 1)

Personnel Required
Equipment Repairer/Mechanic

References
Not Applicable

Equipment Condition
Applicator module set on level ground
Engine off and cool

REMOVAL

WARNING

HOT AREA

Allow engine to cool before removal of the muffler. Severe burns may result if muffler is handled while still hot.

1. Remove two hex-nuts and lock washers (Figure 1, Item 1).
2. Remove exhaust pipe (Figure 1, Item 2) and gasket (Figure 1, Item 3). Discard gasket.
3. Remove screw (Figure 2, Item 2), flat and lock washers, and nut securing pipe to burner.
4. Remove exhaust pipe (Figure 2, Item 1).

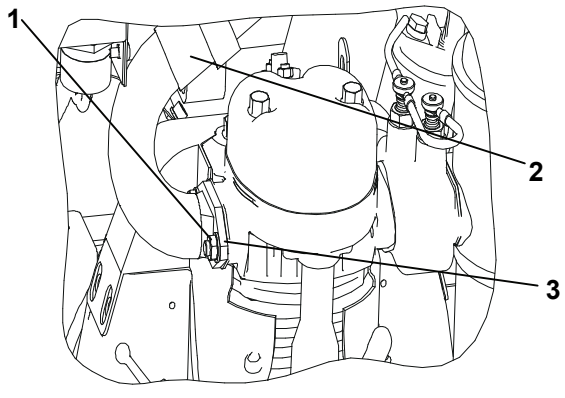


Figure 1. Exhaust Pipe Assembly - Removal.

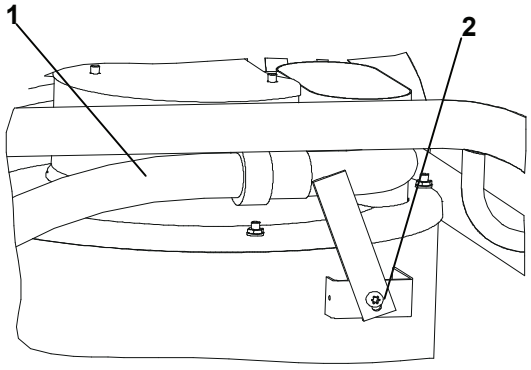


Figure 2. Exhaust Pipe Support - Removal.

END OF TASK

INSTALLATION

1. Install new exhaust pipe (Figure 3, Item 1) to burner outlet.
2. Secure pipe to burner with screw (Figure 3, Item 2), flat washer, new lock washer and nut
3. Install new gasket (Figure 4, Item 3).
4. Install exhaust pipe (Figure 4, Item 2) to engine.
5. Install new lock washers and hex-nuts (Figure 4, Item 1).

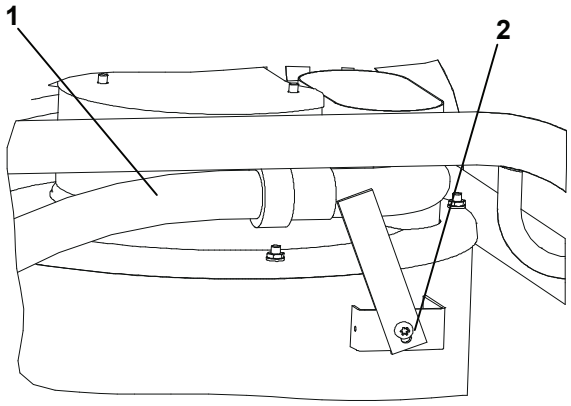


Figure 3. Exhaust Pipe Support - Installation.

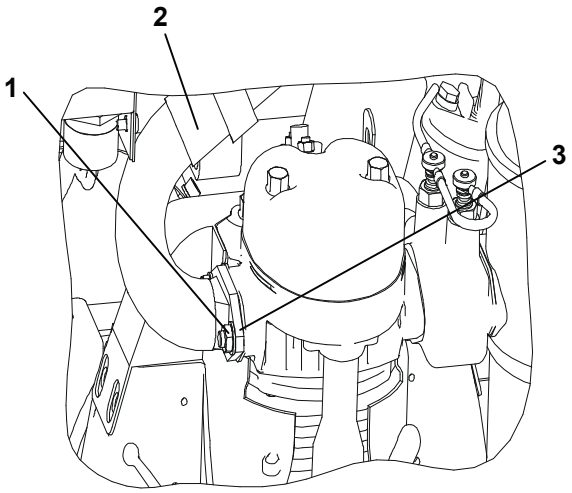


Figure 4. Exhaust Pipe Assembly - Installation.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
HANDLE REPLACEMENT

INITIAL SETUP:

Test Equipment
Not Applicable

Tools
Tool Kit, General Mechanic (WP 0082, Item 2)

Materials/Parts
Grip, Foam (WP 0076, Item 4)
Handle, Manual (WP 0076, Item 2)

Personnel Required
Equipment Repairer/Mechanic

Reference
Not Applicable

Equipment Condition
Applicator module set on level ground
Engine off

REPLACE HANDLE

1. Loosen and remove handle retaining bolt (Figure 1, Item 3).
2. Remove handle (Figure 1, Item 2) from frame section.
3. Insert replacement handle (Figure 1, Item 2) into frame section.
4. Align handle mounting hole to frame section and insert retaining bolt (Figure 1, Item 3). Tighten bolt.

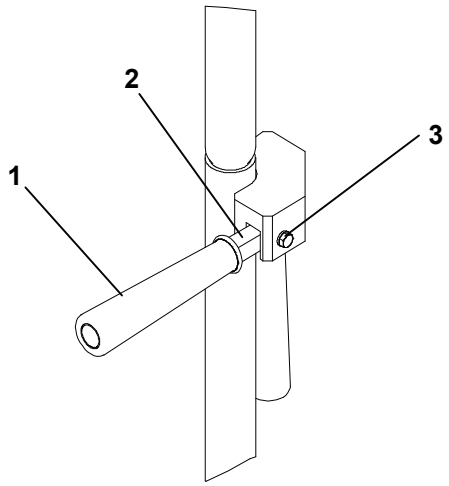


Figure 1. Handle.

END OF TASK

REPLACE HANDLE COVER

1. Remove rubber handle cover (Figure 1, Item 1) by sliding it off of handle (Figure 1, Item 2).
2. Install replacement rubber handle cover (Figure 1, Item1) onto handle (Figure 1, Item 2).

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
MAINTENANCE OF SHOWER ASSEMBLY

INITIAL SETUP:

Test Equipment

Temperature Reader (WP 0082, Item 4)

Tools

Tool Kit, General Mechanics (WP 0082, Item 2)
Brush, filter (WP 0082, Item 1)

Materials/Parts

Parts Kit, Water Mix (WP 0077, Item 31)
Hose Clamp (2) (WP 0077, Item 33)
Hose, Non-Metallic (WP 0077, Item 32)
Tube Assembly Inlet (WP 0077, Item 36)
Tube Assembly Middle Section,
(WP 0077, Item 41)
Tube Metallic Hose End (WP 0077, Item 43)
Hose Assembly, Non-Metallic
(WP 0077, Item 48)
Nozzle, Spray (6) (WP 0077, Items 39, 42 & 44)
Bushing Pipe (WP 0077, Item 46)
Elbow (WP 0077, Item 47)
Coupling Half Inlet (WP 0077, Item 37)
Bushing, Pipe Inlet (WP 0077, Item 38)
Gasket (WP 0077, Items 40 & 45)
Accessory Kit (WP 0082, Item 1)
Teflon Tape (WP 0083, Item 14)
Cloth, Cleaning (WP 0083, Item 3)

Personnel Required

Equipment Repairer/Mechanic (2)

References

TM 3-4230-238-10

Equipment Condition

Preparation for Use (Operator's Manual, WP 0005)

Hose and safety valve assembly laid out on a flat surface.

INTRODUCTION

WARNING

HOT AREA

The shower assembly sections will become hot during operation. Severe burns may result if handled before allowing to cool.

This work package contains information for performing maintenance on the Shower Assembly. The Shower Assembly is an accessory item of equipment used for showering personnel. It is operated with the M26 applicator module.

INTRODUCTION - CONTINUED

This work package contains the following tasks:

- Shower Injector Safety Valve Assembly Functional Test
- Shower Injector Safety Valve Assembly Replacement
- Shower Injector Suction Hose Replacement
- Shower Tube and Spray Nozzle Inspection and Replacement
- Shower Tube Coupling Replacement
- Shower Hose Replacement

SHOWER INJECTOR SAFETY VA LVE ASSEMBLY F UNCTIONAL TEST

Person 1:

1. Verify applicator module has been prepared for Shower Assembly Setup and Operation (Operator's Manual, WP0011).
   a. Connect water suction hose (Figure 1, Item 1) to water pump inlet of applicator module.
   b. Attach suction ÿlter basket (Figure 1, Item 2) to water suction hose (Figure 1, Item 1).
   c. Place water suction hose (Figure 1, Item 1) and suction ÿlter basket (Figure 1, Item 2) into clean water source.

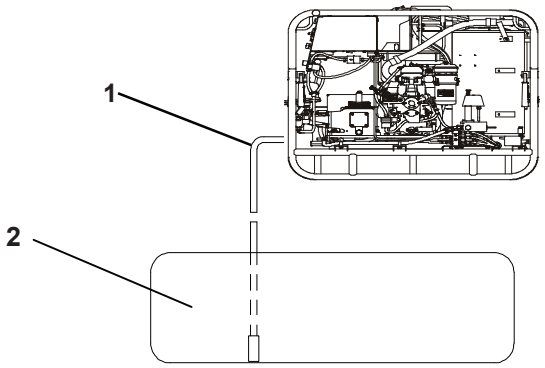


Figure 1. Cold Water Intake.

2. Remove cap from heater water outlet of applicator module, connect high-pressure hose (Figure 2, Item 1) to heater water outlet.

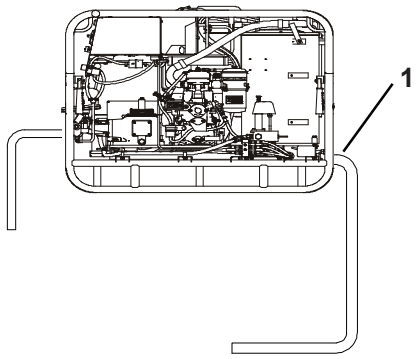


Figure 2. High Pressure Hose Connection.

SHOWER INJECTOR SAFETY VALVE ASSEMBLY FUNCTIONAL TEST - CONTINUED

3. Remove cap from inlet of cold water injector (Figure 3, Item 3).

4. Connect high-pressure hose (Figure 3, Item 1) to high-pressure inlet of Shower Assembly cold-water injector (Figure 3, Item 3).

NOTE

Both water supply hoses can be placed into same clean water source.

5. Place suction hose and suction filter basket (Figure 3, Item 2) from cold-water injector (Figure 3, Item 3) into water supply.

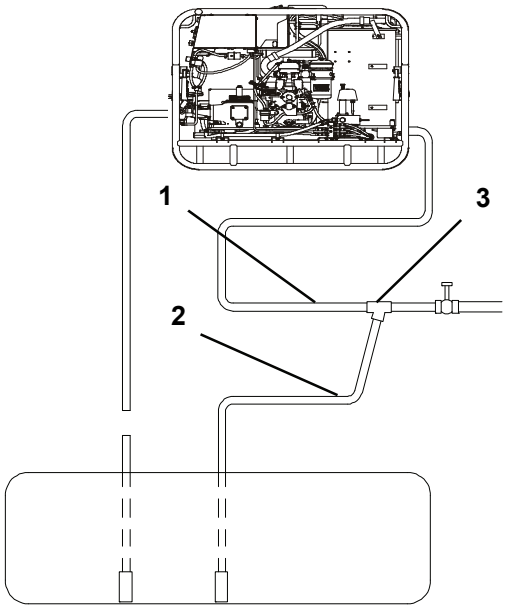


Figure 3. High-Pressure Inlet of Cold-Water Injector.

6. Start applicator module (Operator's Manual, WP0007).

SHOWER INJECTOR SAFETY VALVE ASSEMBLY FUNCTIONAL TEST - CONTINUED

WARNING

The selector switch must be set to 120 °F/50 °C (shower) position. If the system safety devices fail, the potential for burns from hot water may exist. The valve automatically closes when the temperature exceeds preset temperature limits.

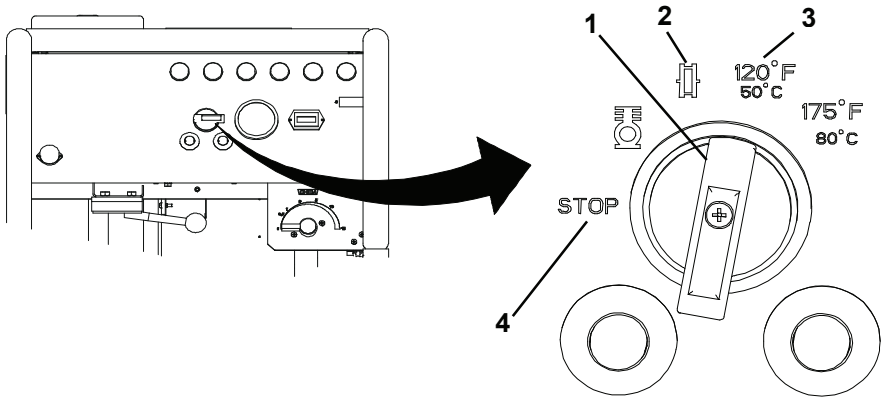


Figure 4. Selector Switch – 120 °F/50 °C.

NOTE

After selector switch is set to 120 °F/50 °C (shower) position and valve is open, water will start to flow. If valve closes, perform RESETTING THE SAFETY TEMPERATURE VALVE (Operator's Manual WP 0011).

7. Set the selector switch (Figure 4, Item 1) to 120 °F/50 °C, shower position, (Figure 4, Item 3).
8. Ensure safety valve is in open position (Figure 5, Item 2). If closed (Figure 5, Item 1) pull up firmly on valve until it is locked in the open position. Allow water to discharge from safety valve until burner indicator lamp goes out.

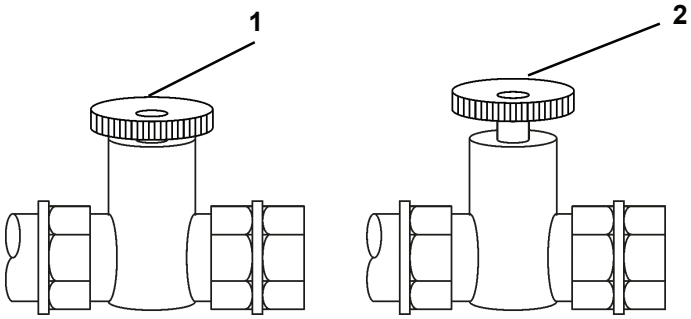


Figure 5. Safety Valve Assembly.

SHOWER INJECTOR SAFETY VALVE ASSEMBLY FUNCTIONAL TEST - CONTINUED

Person 2:

9. Remove suction hose and suction filter basket (Figure 3, Item 2) of cold-water injector (Figure 3, Item 3) from water source. Place filter basket away from personnel where water can drain.

10. Verify water is still flowing out of safety valve (Figure 6, Item 4).

Person 1:

11. Set selector switch (Figure 4, Item 1) to hot water (175 °F/80 °C) position.

Person 2:

12. Monitor temperature of water flowing out of safety valve (Figure 6, Item 4) using Infrared Temperature Reader.

WARNING

Water flowing from suction hose and filter basket will be very hot. Be sure basket is not located near personnel.

13. Observe safety valve and record temperature of water being discharged from cold-water injector when safety valve closes (Figure 5, Item 1). If recorded temperature at time safety valve closed exceeded 135 °F, replace safety valve.

14. Verify water stops flowing out of safety valve (Figure 6, Item 4). Water will flow back through suction filter hose and basket.

Person 1:

15. Set selector switch to start position (Figure 4, Item 4).

Person 2:

16. Place suction hose and suction filter basket (Figure 3, Item 2) of cold-water injector Figure 3, Item 3) into water source.

Person 1:

17. Set selector switch (Figure 4, Item 1) to pump position (Figure 4, Item 2). Allow water to cycle through applicator module and safety valve for two minutes.

18. Shutdown applicator module (Operator's Manual, WP0013).

END OF TASK

SHOWER INJECTOR SAFETY VALVE ASSEMBLY REPLACEMENT

REMOVAL

1. Loosen suction hose band clip (Figure 6, Item 2) attached on end of suction hose (Figure 6, Item 1).
2. Disconnect suction hose (Figure 6, Item 1) from safety valve hose coupling (Figure 6, Item 3). Retain hose band clip.

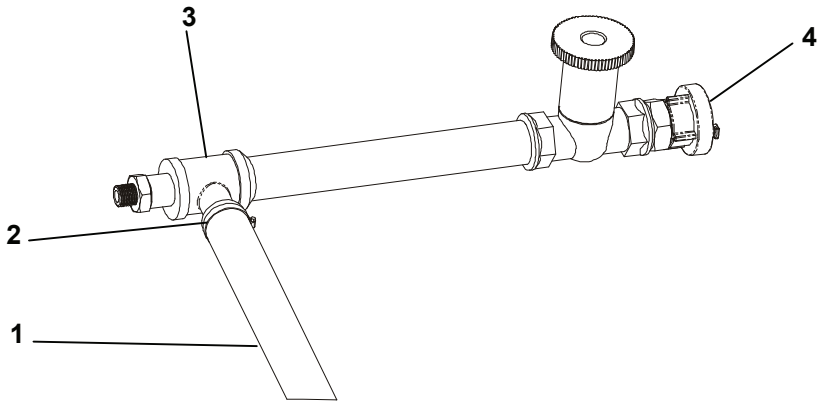


Figure 6. Safety Valve Assembly.

END OF TASK

INSTALLATION

1. Place suction hose band clip (Figure 6, Item 2) on end of suction hose (Figure 6, Item 1).
2. Slide suction hose (Figure 6, Item 1) over hose coupling (Figure 6, Item 3) on new valve.
3. Tighten hose band clip (Figure 6, Item 2).
4. Perform functional test in this WP.

END OF TASK

SHOWER INJECTOR SUCTION HOSE REPLACEMENT

REMOVAL

1. Loosen suction hose band clip (Figure 7, Item 2) on each end of suction hose (Figure 7, Item 1).
2. Pull suction hose (Figure 7, Item 1) from each hose coupling (Figure 7, Item 3). Retain hose band clips and hose couplings.

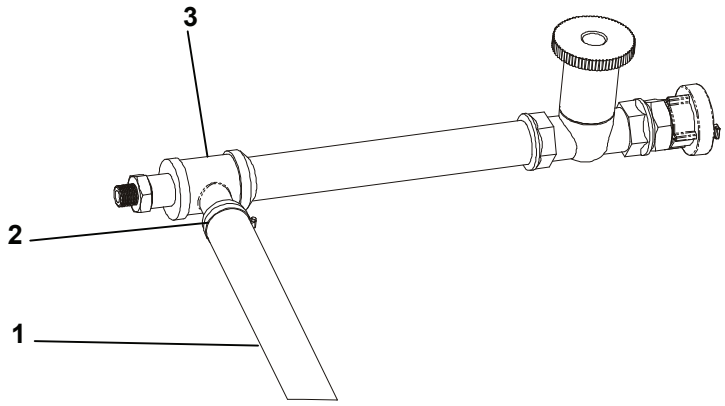


Figure 7. Injector/Safety Valve Assembly.

END OF TASK

INSTALLATION

1. Place the hose band clips (Figure 7, Item 2) on new hose.
2. Slide suction hose (Figure 7, Item 1) over hose coupling (Figure 7, Item 3) on each end of hose.
3. Tighten both hose clamps (Figure 7, Item 2).
4. Operate applicator module to ensure no leaks are present (Operator's Manual, WP 0008 and WP 0011).

END OF TASK

SHOWER TUBE AND SPRAY NOZZLE INSPECTION AND REPLACEMENT

REMOVAL/INSPECTION

1. Remove damaged or clogged shower spray nozzles (Figure 8, Item 1) from shower tube (Figure 8, Item 2) or shower hose (not shown).

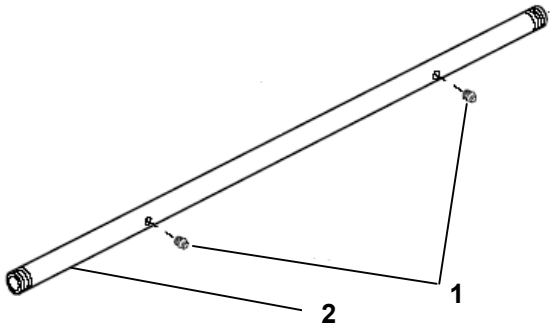


Figure 8. Shower Tube and Spray Nozzles.

2. Inspect shower spray nozzle outlet for damage or being clogged. Inspect spray nozzle installation threads for damaged or missing threads. If spray nozzles (Figure 8, Item 1) are clogged, remove debris. If spray nozzle outlet or installation threads are damaged, replace spray nozzle (Figure 8, Item 1).

3. Inspect shower tube (Figure 8, Item 2) or shower hose for damaged spray nozzle installation threads. If shower tube, spray nozzles or shower hose installation threads are damaged, replace shower tube assembly or shower hose.

END OF TASK

CAUTION

Do not block nozzle opening with Teflon tape prior to replacement.

REPLACEMENT

1. Apply 2-3 wraps of Teflon tape clockwise on spray nozzle (Figure 9, Item 1) installation threads.

2. Install spray nozzle(s) (Figure 8, Item 1) into shower tube assembly (Figure 8, Item 2). Tighten spray nozzle.

Figure 9. Spray Nozzle.

END OF TASK

SHOWER TUBE COUPLING REPLACEMENT

REMOVAL

1. Remove coupling (Figure 10, Item 3) and pipe bushing (Figure 10, Item 1) from shower tube assembly (Figure 10, Item 2)

2. Check condition of pipe bushing (Figure 10, Item 1) on shower tube assembly (Figure 10, Item 2). Clean with filter brush, if necessary. If pipe bushing threads are damaged, remove bushing from shower tube assembly (Figure 10, Item 2) and replace.

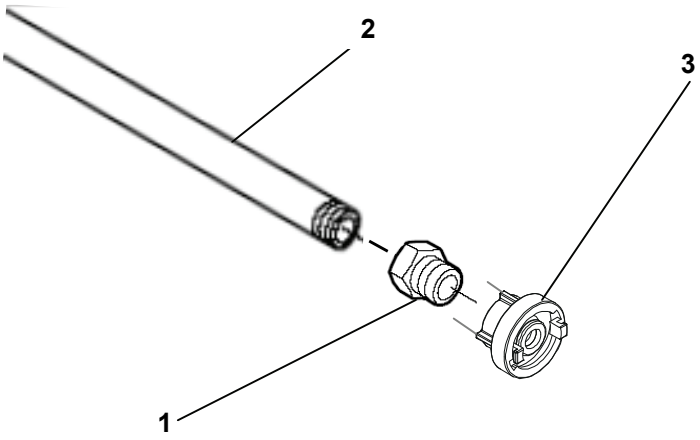


Figure 10. Shower Tube Coupling Replacement.

END OF TASK

INSTALLATION

1. Apply 2-3 wraps of Teflon tape clockwise on pipe bushing (Figure 10, Item 1) and 2-3 wraps clockwise on shower tube assembly (Figure 10, Item 2).

2. Install pipe bushing onto shower tube (Figure 10, Item 2) and tighten.

3. Install coupling (Figure 10, Item 3) onto pipe bushing (Figure 10, Item 1) and tighten.

END OF TASK

SHOWER HOSE REPLACEMENT

REMOVAL

1. Remove shower hose spray nozzle (Figure 11, Item 5) from shower hose (Figure 11, Item 4).
2. Remove shower hose (Figure 11, Item 4) from shower tube assembly (Figure 11, Item 1). Discard hose.
3. Check threads on shower tube elbow (Figure 11, Item 3). If damaged, replace elbow (Figure 11, Item 3).

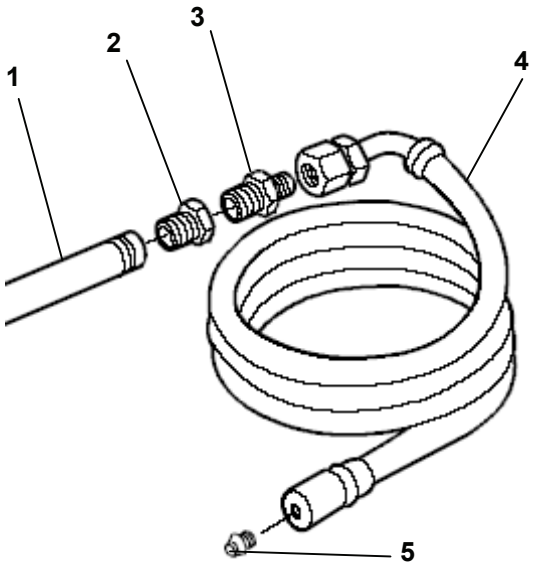


Figure 11. Shower Hose Replacement.

END OF TASK

INSTALLATION

1. Apply 2-3 wraps of Teflon tape clockwise on elbow (Figure 11, Item 3). If the elbow is being replaced, installation of Teflon tape is also required on shower tube pipe bushing (Figure 11, Item 2) connection to elbow.
2. If elbow (Figure 11, Item 3) has been replaced, install elbow (Figure 11, Item 3) onto shower tube pipe bushing (Figure 6, Item 2). Tighten.
3. Install shower hose (Figure 11, Item 4) onto shower tube elbow (Figure 11, Item 3). Tighten shower hose (Figure 11, Item 4).
4. Apply 2-3 wraps of Teflon tape clockwise on shower spray nozzle (Figure 11, Item 5). Install spray nozzle (Figure 11, Item 5) onto shower hose (Figure 11, Item 4). Tighten nozzle (Figure 11, Item 5).

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
PREPARATION FOR STORAGE OR SHIPMENT

INITIAL SETUP:

Test Equipment
Not Applicable

Tools
Brush, filter (WP 0082, Item 1)

Materials/Parts
Material Handling Equipment
Banding material
Antifreeze
Oil, Engine
Tape, Electrical (WP 0083, Item 13)
Pan, Drain (WP 0083, Item 8)
Cloth, Cleaning (WP 0083, Item 3)
Accessory Kit (WP0082, Item 1)

Personnel Required
Equipment Repairer/Mechanic (4)

References
TM 3-4230-238-10
SPI P91000-100

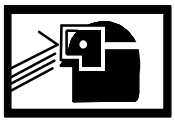
Equipment Condition
Applicator Module shutdown (Operator's Manual, WP 0013)

INTRODUCTION

This WP provides information and instruction for administrative storage (greater than 30 days) at moderate temperatures, administrative storage at extreme cold temperatures, and non-tactical shipment. For short-term storage or tactical transport, see Operator's Manual, WP 0015.

WARNING

CHEMICAL


EYE PROTECTION

POISON

HEAVY OBJECTS

Antifreeze is a mild to moderate eye irritant if exposed directly in the eye and is highly toxic if ingested. Ingestion causes drunkenness rapidly passing into a coma and is associated with serious or fatal kidney injury. Wear eye protection, protective clothing, and protective gloves

The applicator module weighs over 550 lbs (249 kg). Avoid lifting injuries by always using MHE to lift, move, and store the applicator module.

NOTE

Lifting handles are used for minor equipment repositioning only and not for loading, unloading, and long distance movement.

MEASURES FOR STORING AND FROST PROTECTION IN EXCESS OF 30 DAYS

When storing the unit for more than 30 days, the following measures are to be carried out in order to protect the equipment against damage through frost and corrosion.

The applicator module is factory-filled with an antifreeze solution that allows the unit to be stored to 5 °F (- 15 °C) as long as it has not been operated previously.

ADMINISTRATIVE STORAGE

1. Select dry, and as much as possible, frost-free location for storing.

NOTE

Follow antifreeze manufacturer's instructions or local OP for mixture ratio of antifreeze solution.

2. In clean container, combine mixture of water and antifreeze, or obtain premixed from local supply.
3. Operate applicator module (Operator's Manual, WP 0008) in cold water mode, for two minutes using antifreeze container as water source.
4. Shutdown applicator module (Operator's Manual, WP 0013).
5. Disconnect both ends of water suction hose (Figure 1, Item 1). Drain hose and reinstall sealing cap (Figure 1, Item 2) onto water pump.

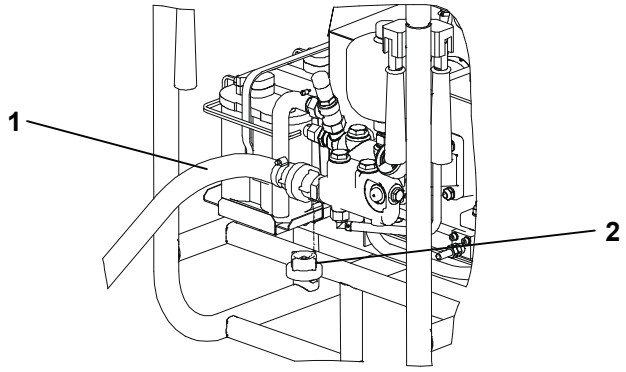


Figure 1. Suction Hose and Sealing Cap Assembly.

6. Disconnect both ends of high pressure hose (Figure 2, Item 1). Remove wand, drain hose and reinstall sealing cap (Figure 2, Item 3) onto water outlet (Figure 2, Item 2).

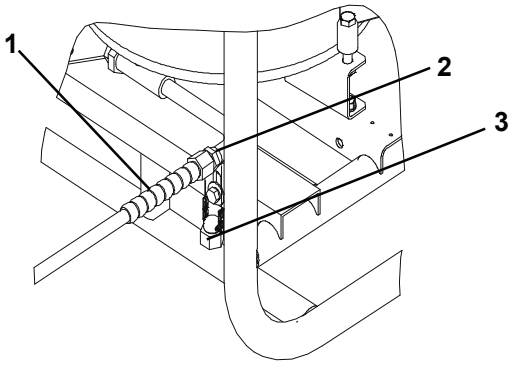


Figure 2. Water Outlet.

ADMINISTRATIVE STORAGE - CONTINUED

WARNING

ELECTRICAL CHEMICAL EYE PROTECTION

Always disconnect battery cables before performing maintenance to prevent electrical shock which could cause injury or death. Always wear eye protection and protective gloves when handling the battery.

7. Disconnect applicator module battery.
   a. Unclip negative terminal protective cover.
   b. Remove negative terminal connector from battery.
8. Disconnect suction lines for calcium inhibitor (Figure 2, Item 1) at solenoid valve (Figure 2, Item 2).
9. Drain lines and then reconnect them to solenoid valve (Figure 2, Item 2).
10. Install tarp onto applicator module
11. Install pallet base and crate (following procedures in this WP), if required.

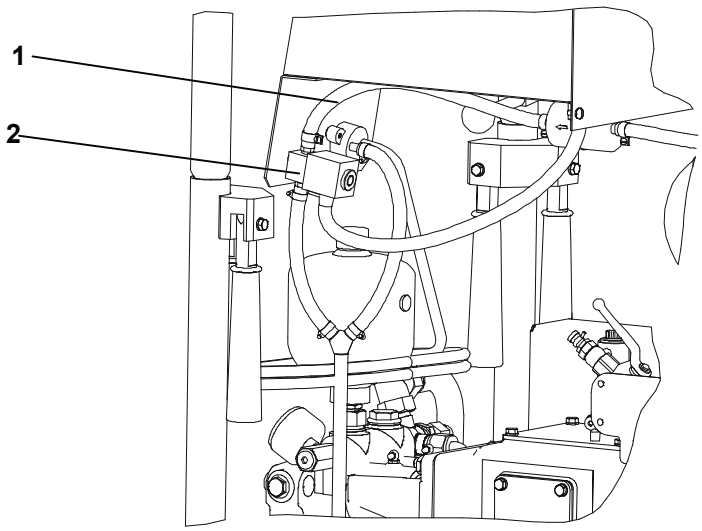


Figure 2. Calcium Inhibitor and Solenoid Valve - Moderate Temp.

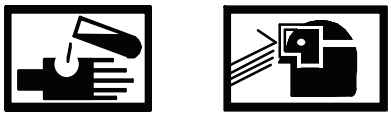
END OF TASK

STORAGE AT EXTREME COLD TEMPERATURES (25 °F to -25°F / -5 °C to -30 °C)/WINTERIZATION PROCEDURES

1. Change engine oil (WP 0051). Refill with engine oil IAW local OP.
2. Service fuel can (Operator's Manual, WP 0025) using winter diesel (e.g., F-75).
3. Connect suction hose with filter and high-pressure hose to applicator module.
4. Insert water suction hose into water source (e.g., water tank).
5. Reconnect applicator module battery.
    a. Attach negative terminal connector.
    b. Close terminal protective cover.
6. Start unit, then switch on water pump.
7. Switch on burner.
8. Operate unit for 5 minutes in this mode.
9. Switch off burner and continue to operate unit for additional 5 minutes in cold-water mode.
10. Switch unit off.
11. Uncouple water hose and high-pressure hose and drain them completely.
12. Connect suction hose with filter and high-pressure hose to applicator module.
13. Place both hoses into container with antifreeze solution.
14. Start applicator module and switch on high-pressure pump.
15. Pump fluid for at least 1 minute through circuit.
16. Shut down applicator module.
17. Uncouple and drain hoses.
18. Mount sealing cap to water pump and secure plug to outlet of unit.

STORAGE AT EXTREME COLD TEMPERATURES (25 °F to -25°F / -5 °C to -30 °C)/ WINTERIZATION PROCEDURES - CONTINUED

WARNING



CHEMICAL **EYE PROTECTION**

Always disconnect battery cables before performing maintenance to prevent electrical shock which could cause injury or death. Always wear eye protection and protective gloves when handling the battery.

19. Disconnect applicator module battery.
    a. Unclip terminal protective covers.
    b. Remove negative terminal connector from battery.

NOTE

Check the charge condition of the battery at least once a month and recharge the battery with a suitable charger (for maintenance-free batteries) as required. It is recommended to remove the battery and temporarily store it at ambient temperatures around 40 - 70 °F (5 - 20 °C). It is not necessary to disconnect the battery for short term storage (e.g., less than once per month).

20. Disconnect suction lines at solenoid valve (Figure 3, Item 2) to drain calcium inhibitor (Figure 3, Item 1).
21. Reconnect suction lines at solenoid valve (Figure 3, Item 2).
22. Install tarp onto applicator module.

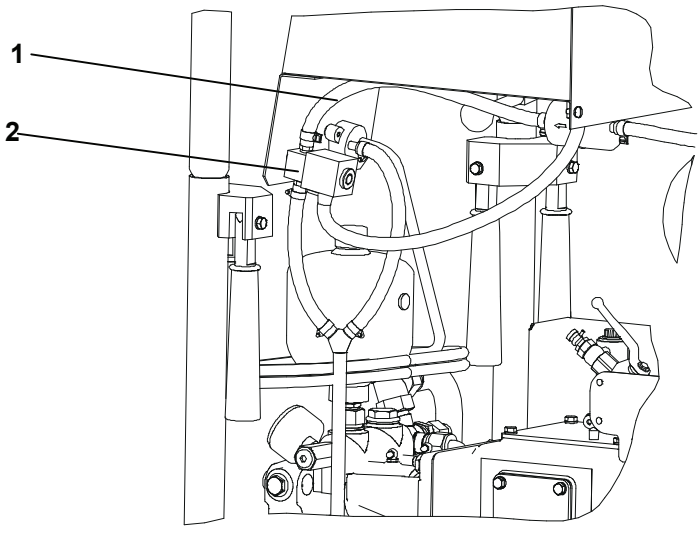


Figure 3. Calcium Inhibitor and Solenoid Valve.

END OF TASK

PREPARATION FOR SHIPMENT

1. Prepare applicator module for short-term storage (Operator's Manual, WP 0014).
2. Verify fuel can is completely empty.
   a. Remove empty fuel can from applicator module. Ensure it is dry and no fumes are present.
   b. If fumes are present or interior of can is visibly wet, completely empty fuel can, IAW local operating procedures.
   c. Return empty fuel can to fuel can bracket in applicator module.

NOTE

Calcium inhibitor container cannot be stored in applicator module or accessory kit during administrative storage or non-tactical shipment.

3. Remove calcium inhibitor container from applicator module:
   a. Unscrew suction tube cap (Figure 4, Item 1) from container (Figure 4, Item 2).
   b. Remove suction tube (Figure 5, Item 2) from calcium inhibitor container (Figure 5, Item 1), letting excess inhibitor drain into container.
   c. Thread end of suction tube into storage location (Figure 5, Item 3).
   d. Remove calcium inhibitor container, replace lid (Figure 5, Item 4) (stored in accessory kit), and turn-in to unit supply IAW local operating procedures.

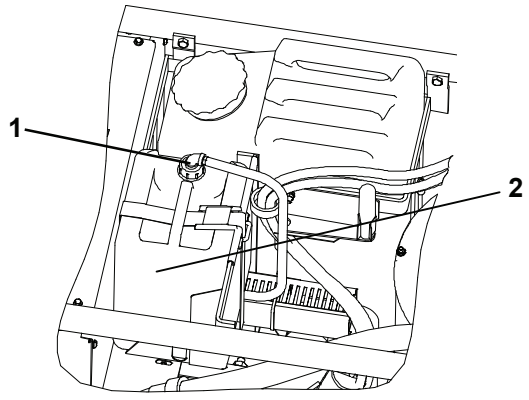


Figure 4. Calcium Inhibitor Assembly.

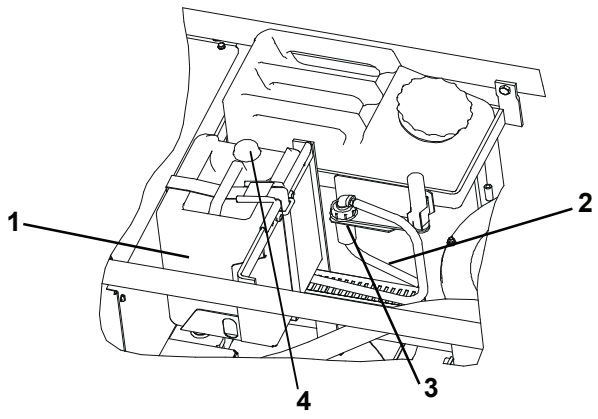


Figure 5. Suction Tube Removed and Stored.

PREPARATION FOR SHIPMENT – CONTINUED

4. Prepare battery for shipment:
   a. Disconnect applicator module battery.
      (1) Unclip terminal protective covers (Figure 6, Item 2).
      (2) Remove negative terminal lug (Figure 6, Item 3) and protective cover (Figure 6, Item 2) from battery.
      (3) Remove positive terminal lug (Figure 6, Item 5) and protective cover (Figure 6, Item 2) from battery.

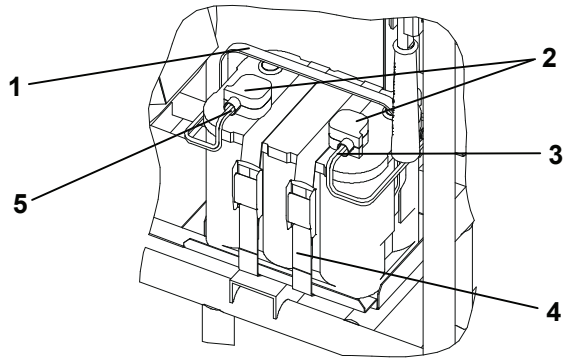


Figure 6. Battery Assembly.

NOTE

Battery may be transported in its holder on applicator module. Do not store or transport battery (or spare batteries) in accessory kit.

   b. Secure battery in holder, ensure straps (Figure 6, Item 4) are tight
   c. Cover battery posts with shipment caps (or electrical tape).

NOTE

Do not allow battery cables to hang in a way that allows them to come into contact with battery.

   d. Coil battery cables up and away from battery. Secure cables to each other with electrical tape. Allow battery cables to hang down from control box. Do not tape or secure coiled cables to applicator module frame.

PREPARATION FOR SHIPMENT - CONTINUED

5. Prepare grease gun for shipment:

   a. Remove installed grease cartridge from grease gun.

   b. Turn in grease cartridges (used and/or unused) IAW with local OP. Grease cartridges cannot be transported in accessory kit.

   c. Wipe down grease gun and store in plastic pouch in accessory kit.

NOTE

Do not pack items unrelated to M26 in accessory kit. Verify that no items containing fuel, lubricants, calcium inhibitor, or other liquids are stored or transported in the accessory kit.

6. Ensure all accessories are dry and clean.
7. Inventory and repack accessory kit (Operator's Manual, WP 0014).
8. Close nine latches on accessory kit and install ties or locks, as required by local operating procedures.
9. Prepare accessory kit for MHE:

WARNING

HEAVY OBJECTS

The accessory box, due to size and weight, requires a four-person lift for removal and installation. Always avoid back injury by lifting with your legs.

NOTE

If two M26 systems will be transported together to the same destination, two accessory kits can be stacked on top of each other and banded onto a single 40X48 pallet.
Do not stack or store other items on top of the accessory kit or applicator module.

   a. Lift accessory kit onto standard 40x48 pallet, using four personnel.

PREPARATION FOR SHIPMENT- CONTINUED

NOTE

Steel strapping (banding) shall comply with the following: ASTM D3953 Type 1, (heavy duty), Finish B, Grade 1 (heavy-coating, galvanized, minimum width 5/8 " by 0.15" thickness. Use seals complying with ASTM D3953 Type 1, (heavy duty), Finish B, Grade 1, Optional style, size corresponding to the width of the strapping used.

b. Band Accessory Case to pallet base using steel banding, following local operating procedures. Use a minimum of two bands on both width and length dimensions.

c. If no local procedure exists, use supplementary instructions in ASTM D4675 for guidance.

10. Prepare Applicator module for MHE:

a. Obtain original pallet base and re-usable box, if available. If original shipping container is not available, rebuild box IAW special packaging instruction, SPI P91000-100.

b. Lift applicator module onto pallet base (Figure 7, Item 1), using MHE.

c. Install bracing blocks (Figure 7, Item 5) parallel to applicator module base, as shown.

d. Lift re-usable box (Figure 7, Item 2), onto applicator module (Figure 7, Item 4), using two personnel.

e. Fasten re-usable box (Figure 7, Item 2), onto pallet base (Figure 7, Item 1), using fasteners (Figure 7, Item 3) from re-usable box.

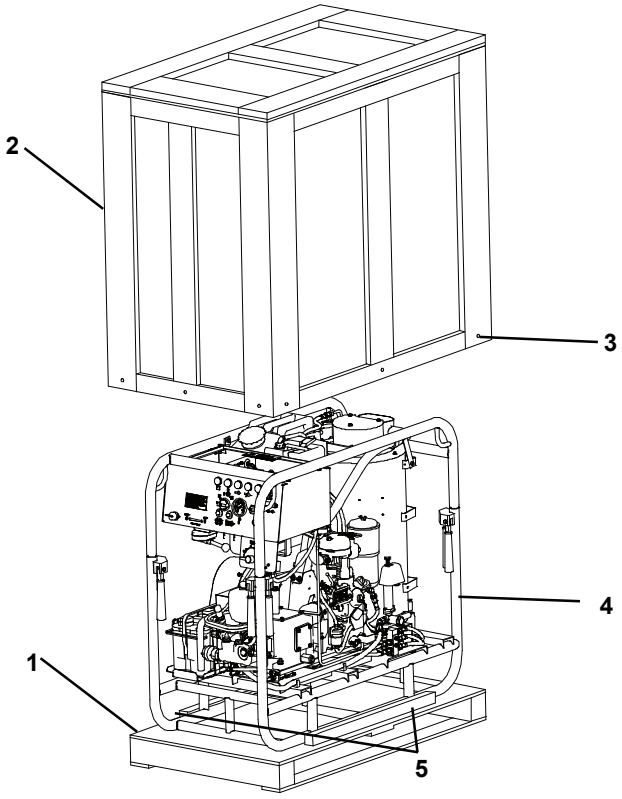
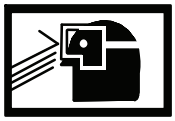


Figure 7. Re-usable box.

PREPARATION FOR SHIPMENT- CONTINUED

WARNING

HEAVY PARTS



EYE PROTECTION

Wear eye protection, protective clothing, and protective gloves when applying or removing banding from equipment. Releasing tension from banding may cause banding to fly off and injure personnel.

NOTE

Do not stack or store accessory kit on top of applicator module box.

NOTE

Steel strapping (banding) shall comply with the following: ASTM D3953 Type 1, (heavy duty), Finish B, Grade 1 (heavy-coating, galvanized, minimum width 5/8 " by 0.15" thickness. Use seals complying with ASTM D3953 Type 1, (heavy duty), Finish B, Grade 1, Optional style, size corresponding to the width of the strapping used.

f. Band box to pallet base using steel banding, following local operating procedures. Use a minimum of two bands on both width and length dimensions.

g. If no local procedure exists, use supplementary instructions in ASTM D4675 for guidance.

END OF TASK

HAZARDOUS MATERIAL INFORMATION

When prepared for shipment, as described in this WP, the M26 is not regulated as a hazardous material for transportation by vessel, rail or by highway in military or commercial vehicles. Hazardous materials shipping papers, marking, and labels are not required for shipments entirely by those three modes, unless local OP states differently.

END OF WORK PACKAGE

CHAPTER 4

PARTS INFORMATION
FOR
DECONTAMINATING APPARATUS: JOINT SERVICE TRANSPORTABLE SMALL SCALE, M26

FIELD AND SUSTAINMENT MAINTENANCE
REPAIR PARTS AND SPECIAL TOOLS LIST (RPSTL)
M26

INTRODUCTION

SCOPE

This RPSTL lists and authorizes spares and repair parts, special tools, special test, measurement, and diagnostic equipment (TMDE), and other special support equipment required for performance of field level maintenance of the M26. It authorizes the requisitioning, issue, and disposition of the spares, repair parts, and special tools as indicated by the source, maintenance, and recoverability (SMR) codes.

GENERAL

In addition to the Introduction Work Package, this RPSTL is divided into the following work packages:

1. Repair Parts List Work Packages. Work packages containing lists of spares and repair parts authorized by this RPSTL for use in the performance of maintenance. These work packages also include parts which must be removed for replacement of the authorized parts. Parts lists are composed of functional groups in ascending alphanumeric sequence, with the parts in each group listed in ascending figure and item number sequence. Sending units, brackets, filters, and bolts are listed with the component they mount on. Bulk materials are listed by item name in FIG. BULK at the end of the work packages. Repair parts kits are listed at the end of the individual work packages. Repair parts for reparable special tools are also listed in a separate work package. Items listed are shown on the associated illustrations.

2. Special Tools List Work Packages. Special Tools List Work Packages. Work packages containing lists of special tools, special TMDE, and special support equipment authorized by this RPSTL (as indicated by Basis of Issue (BOI) information in the DESCRIPTION AND USABLE ON CODE (UOC) column). Tools that are components of common tool sets and/or Class VII are not listed.

3. Cross-Reference Indexes Work Packages. There are two cross-reference indexes work packages in this RPSTL: the National Stock Number (NSN) Index work package, *and* the Part Number (P/N) Index work package. The National Stock Number Index work package refers you to the figure and item number. The Part Number Index work package refers you to the figure and item number.

EXPLANATION OF COLUMNS IN THE REPAIR PARTS LIST AND SPECIAL TOOLS LIST WORK PACKAGES

ITEM NO. (Column (1)). Indicates the number used to identify items called out in the illustration.

SMR CODE (Column (2)). The SMR code containing supply/requisitioning information, maintenance level category authorization criteria, and disposition instruction, as shown in the following breakout. This entry may be subdivided into 4 subentries, one for each service.

Table 1. SMR Code Explanation

Source Code XX	Maintenance Code XX		Recoverability Code X
1st two positions: How to get an item.	3rd position: Who can install, replace or use the item.	4th position: Who can do complete repair* on the item.	5th position: Who determines disposition action on unserviceable items.

* Complete Repair: Maintenance capacity, capability, and authority to perform all corrective maintenance tasks of the “Repair” function in a use/user environment in order to restore serviceability to a failed item.

Source Code. The source code tells you how to get an item needed for maintenance, repair, or overhaul of an end item/equipment. Explanation of source codes follows:

Source Code	Application/Explanation
PA PB PC PD PE PF PG PH PR PZ	**NOTE** Items coded PC are subject to deterioration. Stock items; use the applicable NSN to request/requisition items with these source codes. They are authorized to the level indicated by the code entered in the third position of the SMR code.
KD KF KB	Items with these codes are not to be requested/requisitioned individually. They are part of a kit which is authorized to the maintenance level indicated in the third position of the SMR code. The complete kit must be requisitioned and applied.
MF - Made at Field MH - Made at below depot/sustainment level ML - Made at SRA MD - Made at Depot MG -Navy Only	Items with these codes are not to be requested/requisitioned individually. They must be made from bulk material which is identified by the part number in the DESCRIPTION AND USABLE ON CODE (UOC) column and listed in the bulk material group of the repair parts list in the RPSTL. If the item is authorized to you by the third position code of the SMR code, but the source code indicates it is made at a higher level, order the item from the higher level of maintenance.
AF-Assembled by field AH-Assembled by below depot sustainment level AL-Assembled by SRA AD-Assembled by depot AG-Navy only	Items with these codes are not to be requested/requisitioned individually. The parts that make up the assembled item must be requisitioned or fabricated and assembled at the level of maintenance indicated by the source code. If the third position code of the SMR code authorizes you to replace the item, but the source code indicates the item is assembled at a higher level, order the item from the higher level of maintenance.
XA	Do not requisition an XA-coded item. Order its next higher assembly. (Refer to the NOTE below.)
XB	If an XB item is not available from salvage, order it using CAGEC and part number.
XC	Installation drawings, diagrams, instruction sheets, field service drawings; identified by manufacturer's part number.
XD	Item is not stocked. Order an XD-coded item through local purchase or normal supply channels using the CAGEC and part number given, if no NSN is available.

NOTE

Cannibalization or controlled exchange, when authorized, may be used as a source of supply for items with the above source codes, except for those source coded "XA" or those aircraft support items restricted by requirements of AR 750-1.

Maintenance Code. Maintenance codes tell you the level(s) of maintenance authorized to use and repair support items. The maintenance codes are entered in the third and fourth positions of the SMR code as follows:

Third Position. The maintenance code entered in the third position tells you the lowest maintenance level authorized to remove, replace, and use an item. The maintenance code entered in the third position will indicate authorization to the following levels of maintenance.

Maintenance Code	Application/Explanation
F -	Field maintenance can remove, replace, and use the item.
H -	Below Depot Sustainment maintenance can remove, replace, and use the item.
L -	Specialized repair activity can remove, replace, and use the item.
G -	Afloat and ashore intermediate maintenance can remove, replace, and use the item (Navy only)
K -	Contractor facility can remove, replace, and use the item
Z -	Item is not authorized to be removed, replace, or used at any maintenance level
D -	Depot can remove, replace, and use the item.

*NOTE – Army may use C in the third position. However, for joint service publications, Army will use O.

Fourth Position. The maintenance code entered in the fourth position tells you whether or not the item is to be repaired and identifies the lowest maintenance level with the capability to do complete repair (perform all authorized repair functions).

NOTE

Some limited repair may be done on the item at a lower level of maintenance, if authorized by the Maintenance Allocation Chart (MAC) and SMR codes.

Maintenance Code	Application/Explanation
F -	Field is the lowest level that can do complete repair of the item.
H -	Below Depot Sustainment is the lowest level that can do complete repair of the item.
L - designator)	Specialized repair activity (enter specialized repair activity or TASMG is the lowest level that can do complete repair of the item.
D -	Depot is the lowest level that can do complete repair of the item.
G -	Both afloat and ashore intermediate levels are capable of complete repair of item. (Navy only)
K -	Complete repair is done at contractor facility
Z -	Nonreparable. No repair is authorized.
B -	No repair is authorized. No parts or special tools are authorized for maintenance of "B" coded item. However, the item may be reconditioned by adjusting, lubricating, etc., at the user level.

Recoverability Code. Recoverability codes are assigned to items to indicate the disposition action on unserviceable items. The recoverability code is shown in the fifth position of the SMR code as follows:

Recoverability Code	Application/Explanation
Z –	Non-repairable item. When unserviceable, condemn and dispose of the item at the level of maintenance shown in 3rd position of SMR code.
F –	Reparable item. When uneconomically reparable, condemn and dispose of the item at the ASB level.
H –	Reparable item. When uneconomically reparable, condemn and dispose of the item at the general support level.
D –	Reparable item. When beyond lower level repair capability, return to depot. Condemnation and disposal of item not authorized below depot level.
L –	Reparable item. Condemnation and disposal not authorized below Depot level.
A –	Item requires special handling or condemnation procedures because of specific reasons (such as precious metal content, high dollar value, critical material, or hazardous material). Refer to appropriate manuals/directives for specific instructions.
G –	Field level reparable item. Condemn and dispose at either afloat or ashore intermediate levels. (Navy only)
K–	Reparable item. Condemnation and disposal to be performed at Contractor facility.

NSN (Column (3)). The NSN for the item is listed in this column.

CAGEC (Column (4)). The Commercial and Government Entity Code (CAGEC) is a five-digit code which is used to identify the manufacturer, distributor, or Government agency/activity that supplies the item.

PART NUMBER (Column (5)). Indicates the primary number used by the manufacturer (individual, company, firm, corporation, or Government activity), which controls the design and characteristics of the item by means of its engineering drawings, specifications standards, and inspection requirements to identify an item or range of items.

NOTE

When you use an NSN to requisition an item, the item you receive may have a different part number from the number listed.

DESCRIPTION AND USABLE ON CODE (UOC) (Column (6)). This column includes the following information:

1. The Federal item name and, when required, a minimum description to identify the item.
2. Part numbers for bulk materials are referenced in this column in the line item entry for the item to be manufactured/fabricated.
3. Hardness Critical Item (HCI). A support item that provides the equipment with special protection from electromagnetic pulse (EMP) damage during a nuclear attack.
4. The statement END OF FIGURE appears just below the last item description in column (6) for a given figure in both the repair parts list and special tools list work packages.

QTY (Column (7)). The QTY (quantity per figure column) indicates the quantity of the item used in the breakout shown on the illustration/figure, which is prepared for a functional group, subfunctional group, or an assembly. A “V” appearing in this column instead of a quantity indicates that the quantity is variable and the quantity may change from application to application.

EXPLANATION OF CROSS-REFERENCE INDEXES WORK PACKAGES FORMAT AND COLUMNS

1. National Stock Number (NSN) Index Work Package. NSN’s in this index are listed in National Item Identification Number (NIIN) sequence.

STOCK NUMBER Column. This column lists the NSN in NIIN sequence. The NIIN consists of the last nine digits of the NSN. When using this column to locate an item, ignore the first 4 digits of the NSN. However, the complete NSN should be used when ordering items by stock number.
For example, if the NSN is 4820-12-331-4486, the NIIN is 12-331-4486.

FIG. Column. This column lists the number of the figure where the item is identified/located. The figures are in numerical order in the repair parts and special tools list work packages.

ITEM Column. The item number identifies the item associated with the figure listed in the adjacent FIG. column. This item is also identified by the NSN listed on the same line.

2. Part Number (P/N) Index Work Package. Part numbers in this index are listed by part number in ascending alphanumeric sequence (vertical arrangement of letter and number combinations which places the first letter or digit of each group in order A through Z, followed by the numbers 0 through 9 and each following letter or digit in like order).

PART NUMBER Column. Indicates the part number assigned to the item.

FIG. Column. This column lists the number of the figure where the item is identified/located in the repair parts list and special tool list work packages.

ITEM Column. The item number is that number assigned to the item as it appears in the figure referenced in the adjacent figure number column.

SPECIAL INFORMATION

Fabrication Instructions. Bulk materials required to manufacture items are listed in the bulk material functional group of this RPSTL. Part numbers for bulk material are also referenced in the Description Column of the line item entry for the item to be manufactured/fabricated. Detailed fabrication instructions for items source coded to be manufactured or fabricated are found in TM 3-4230-238-23&P.

Index Numbers. Items which have the word BULK in the figure column will have an index number shown in the item number column. This index number is a cross-reference between the National Stock Number/Part Number Index and the bulk material list in the repair parts list work packages.

Associated Publications. The publications listed below pertain to the Decontaminating Apparatus: Transportable Small Scale, M26.

TM 3-4230-238-10 Operator Maintenance Manual for Decontaminating Apparatus: Joint Service Transportable Small Scale M26.

TM 3-4230-238-23&P Field Maintenance Manual Including Repair Parts and Special Tools List for Decontaminating Apparatus: Joint Service Transportable Small Scale M26.

Illustrations List. The illustrations in this RPSTL contain field authorized items. Illustrations published in TM 3-4230-238-23&P, that contain unit authorized items also appear in the RPSTL. The tabular list in the repair parts list work package contains only those parts coded “F” in the third position of the SMR code, therefore, there may be a break in the item number sequence.

HOW TO LOCATE REPAIR PARTS

1. When NSNs or Part Numbers Are Not Known.

First. Using the table of contents, determine the assembly group to which the item belongs. This is necessary since figures are prepared for assembly groups and subassembly groups, and lists are divided into the same groups.

Second. Find the figure covering the functional group or the subfunctional group to which the item belongs.

Third. Identify the item on the figure and note the number(s).

Fourth. Look in the repair parts list work packages for the figure and item numbers. The NSNs and part numbers are on the same line as the associated item numbers.

2. When NSN Is Known.

First. If you have the NSN, look in the STOCK NUMBER column of the NSN index work package. The NSN is arranged in NIIN sequence. Note the figure and item number next to the NSN.

Second. Turn to the figure and locate the item number. Verify that the item is the one you are looking for.

3. When Part Number Is Known.

First. If you have the part number and not the NSN, look in the PART NUMBER column of the part number index work package. Identify the figure and item number.

Second. Look up the item on the figure in the applicable repair parts list work package.

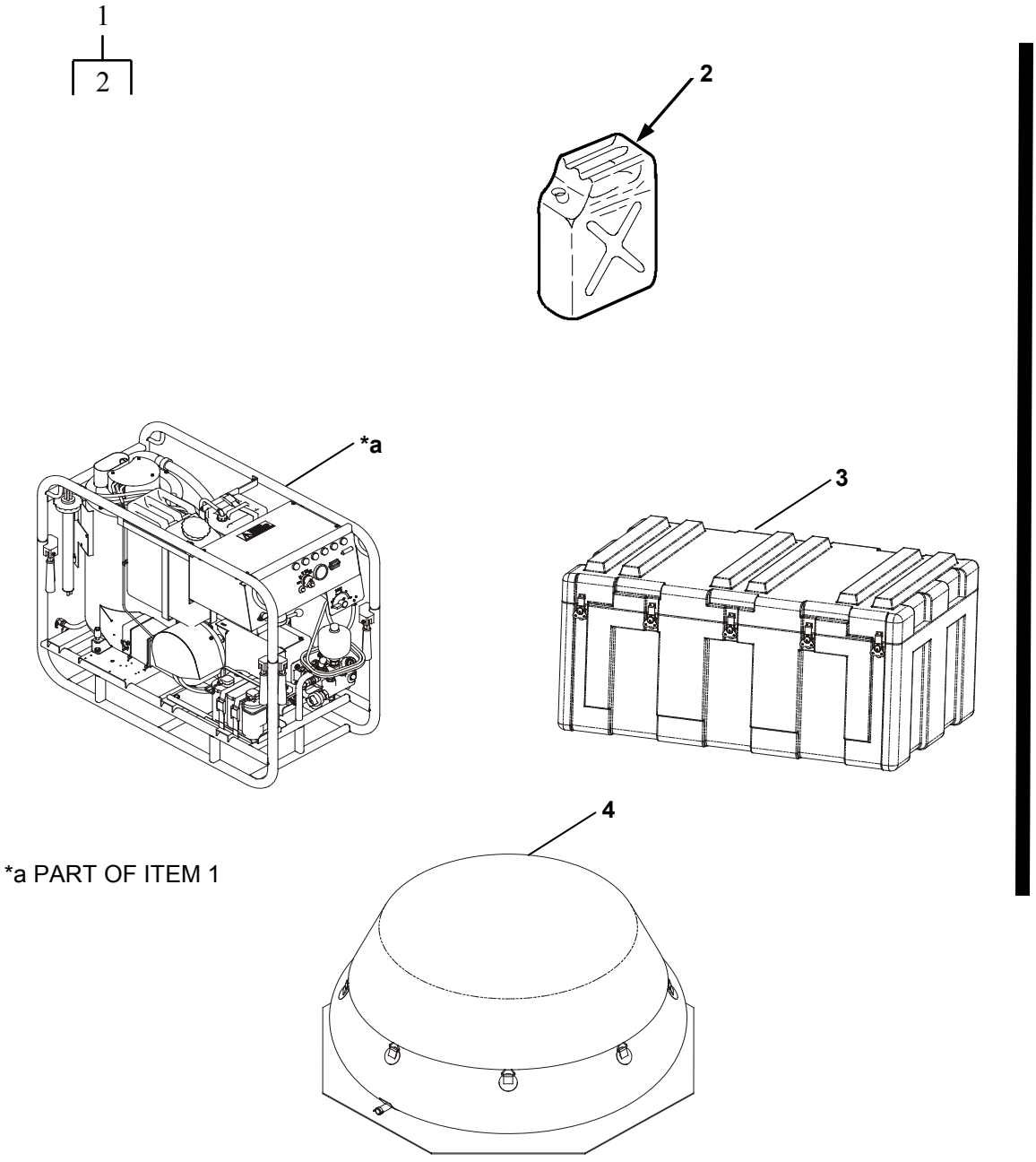


Figure 1. Decontamination Apparatus; Transportable Small Scale, M-26.

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USUABLE ON CODE (UOC)	(7) QTY
					GROUP 01	
					FIG. 1 DECONTAMINATION APPARATUS; TRANSPORTABLE SMALL SCALE, M26	
*1	XAFDD		5RQL2	91000-100	APPLICATOR MODULE	1
*2	PAFZZ	7240-01-337-5269	56161	10502788	.CAN, MILITARY	1
*3	PAFZZ	8145-01-566-8747	0ZUC7	TMS050202	SHIPPING AND STORAGE CONTAINER	1
*4	PAFFF	5430-01-543-0155	05YK6	RCF-3K-OT-OP	TANK, FABRIC COLLAPSIBLE	1
					END OF FIGURE	

END OF WORK PACKAGE

FIELD MAINTENANCE
REPAIR PARTS AND SPECIAL TOOLS LIST (RPSTL)
PUMP, RECIPROCATING

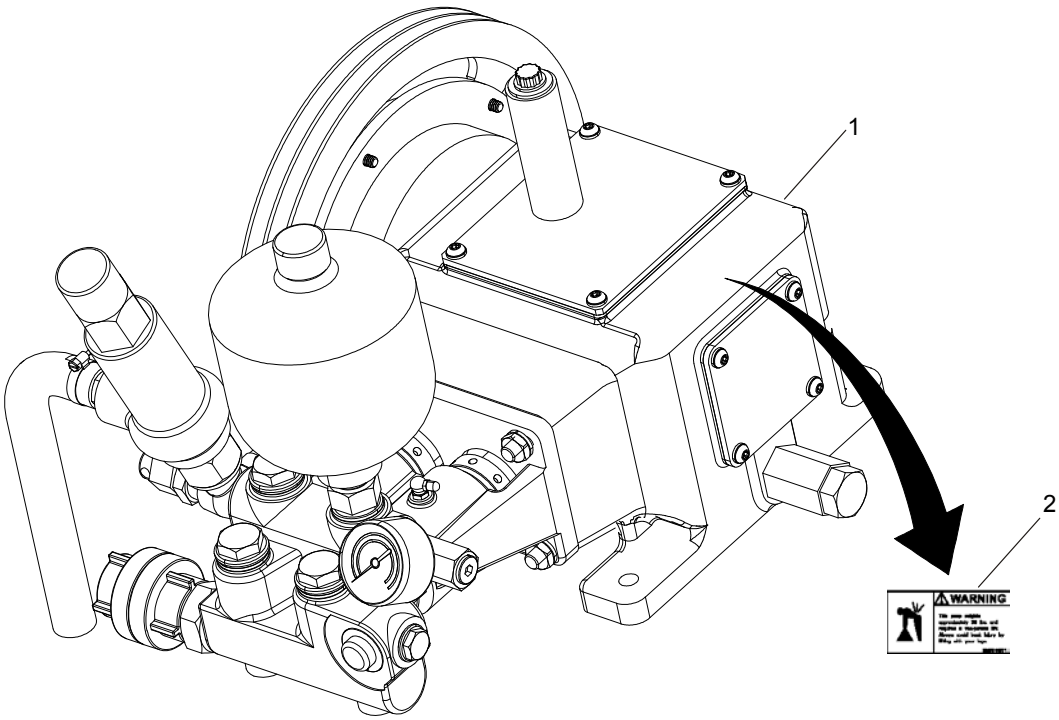


Figure 3. Pump, Reciprocating (Sheet 1 of 5).

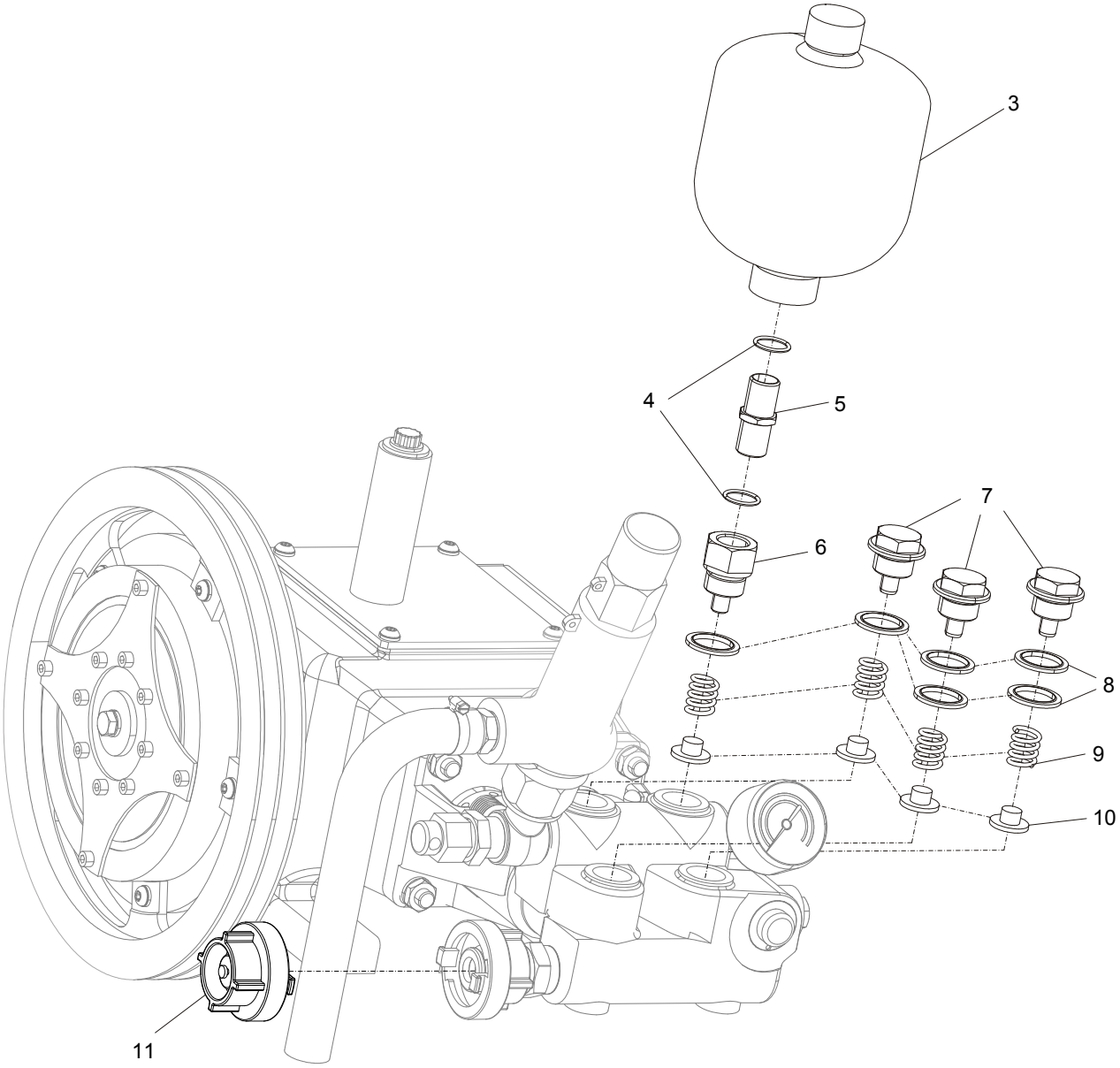


Figure 3. Pump, Reciprocating (Sheet 2 of 5).

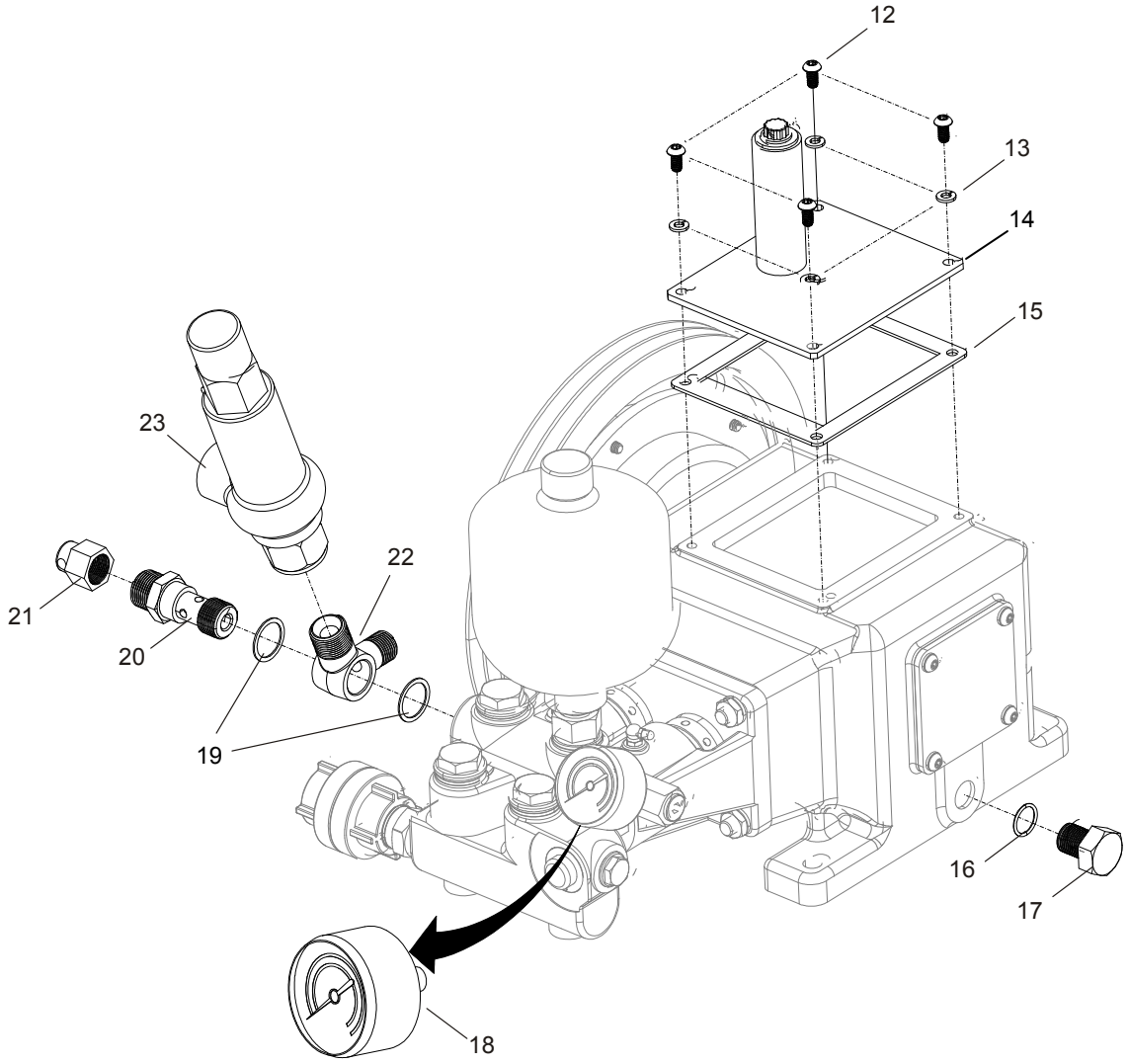


Figure 3. Pump, Reciprocating (Sheet 3 of 5).

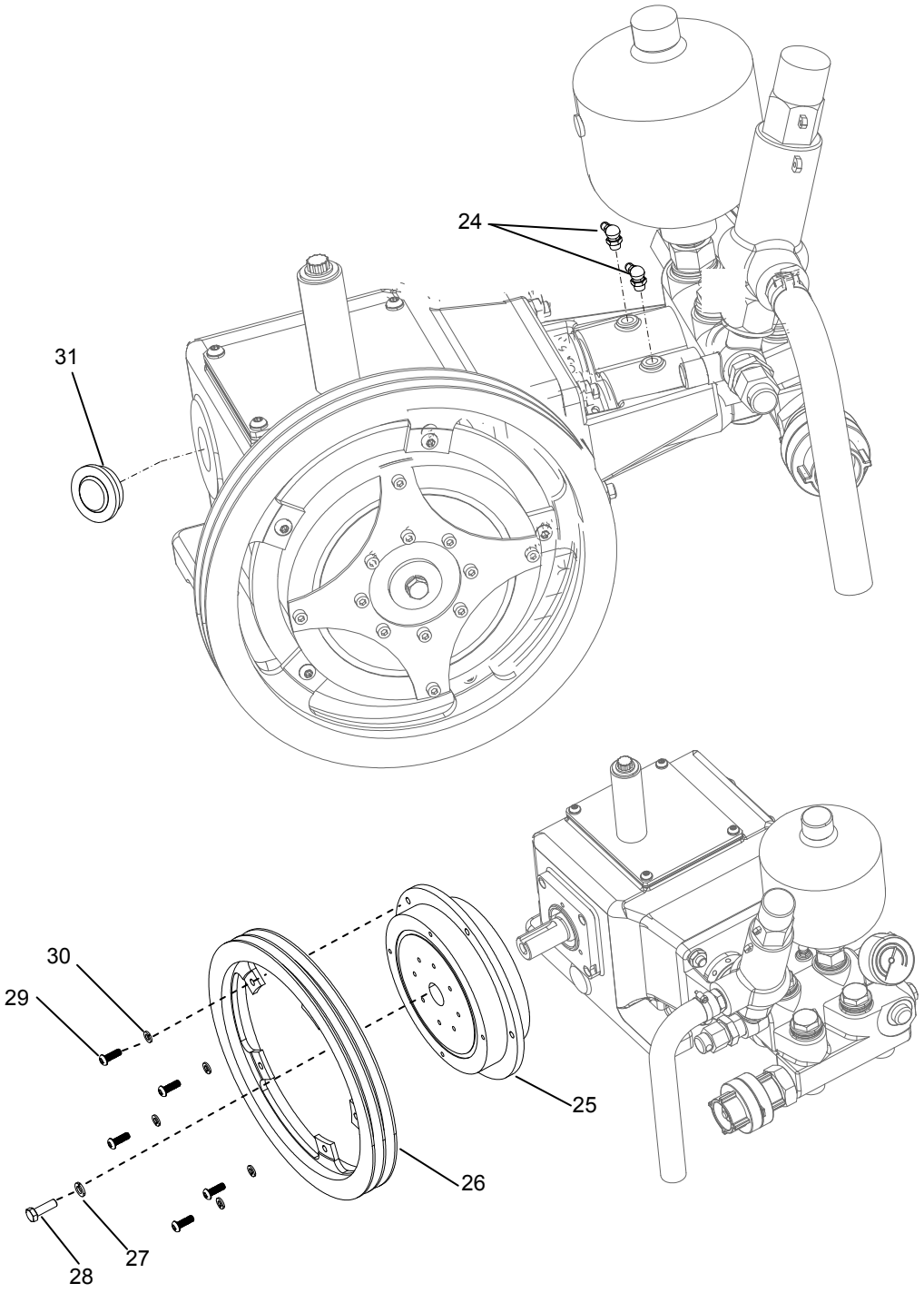


Figure 3. Pump, Reciprocating (Sheet 4 of 5).

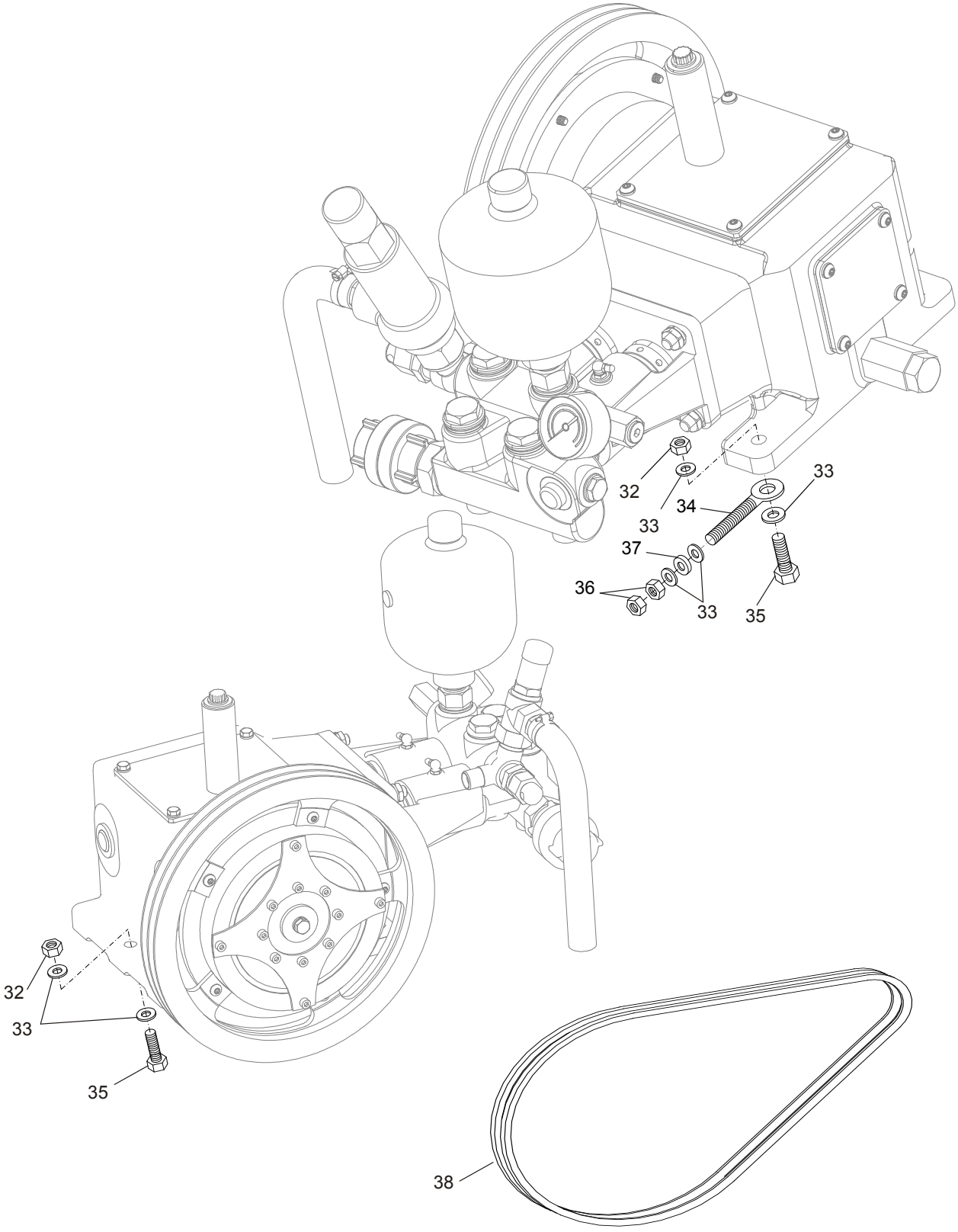


Figure 3. Pump, Reciprocating (Sheet 5 of 5).

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USUABLE ON CODE (UOC)	(7) QTY
					GROUP 0101	
					FIG. 3 PUMP, RECIPROCATING	
1	PAFDD	4320-12-375-2254	D0356	2.641-231.0	PUMP, RECIPROCATING	1
*2	XBFZZ		98255	91157	. LABEL, PUMP WEIGHT	1
*3	PAFZZ	4310-12-374-8212	C1861	SBO2100,75 E2/4 26U-210FX040	. TANK, PRESSURE	1
*4	PAFZZ	ITEM DELETED	D0356	6.362-228.0	. .GASKET	2
*5	PAFZZ	ITEM DELETED	D8286	DIN7631-12-X6CRNIMOTI 17-12-2	. .NIPPLE, TUBE	1
*6	PAFZZ	ITEM DELETED	D0356	5.583-082.0	. .REGULATING ELEMENT	1
*7	PAFZZ	5365-12-374-7653	D0356	5.581-299.0	. PLUG MACHINE THREAD	3
*8	PAFZZ	5330-12-122-1946	D0356	6.362-228.0	. GASKET	6
*9	PAFZZ	5360-12-379-2669	D0356	5.332-537.0	. SPRING, HELICAL COMP	4
*10	PAFZZ	4820-12-379-1615	D0356	5.582-138.0	. DISK VALVE	4
11	PAFZZ	4730-12-372-8569	D0356	7.545-010.0	. COUPLING,HOSE	1
*12	PAFZZ	5305-12-374-9143	D0356	7.306-090.0	. SCREW,CAP,SOCKET HEAD	9
*13	PAFZZ	5310-12-142-0659	D8286	DIN127-B6-FST-A3P	. WASHER, LOCK	9
*14	XBFZZ	5340-12-386-4252	D0356	4.063-095.0	. COVER	1
15	PAFZZ	5330-12-331-0112	D0356	5.364-039.0	. GASKET	1
*16	PAFZZ	5330-12-156-4526	D0356	7.362-009.0	. GASKET	1
17	XBFZZ		D0356	7.382-005.0	. SCREW PLUG M18 X 1.5	1
*18	PAFZZ	6685-01-583-1253	0J4J1	50695851	. GAGE, PRESSURE	1
19	PAFZZ	5330-12-133-9431	D0356	7.362-023.0	. GASKET	2
*20	PAFZZ	4730-12-380-6798	D0356	6.369-997.0	. BOLT, FLUID PASSAGE	1
21	PAFZZ	4730-12-376-6228	D0356	4.412-004.0	. TAILPIECE UNION	1
*22	PAFZZ	4730-12-379-1127	D0356	6.391-380.0	. CONNECTOR, MULTIPLE, FLUID,PASSAGE	1
23	PAFZZ	4820-12-374-9113	D0356	6.413-431.0	. VALVE, SAFETY RELIEF	1
*24	PAFZZ	4730-12-374-9097	D0356	6.417-014.0	. FITTING, LUBRICATION	2
25	PAFZZ	2520-12-309-1672	D0356	6.465-006.0	. CLUTCH, MAGNETIC	1
26	PAFZZ	3020-12-309-1671	D0356	5.625-100.0	. PULLY, GROOVE	1
*27	PAFZZ	5310-12-142-0658	D8286	DIN127-B8-FST-A3P	. WASHER, LOCK	1
*28	PAFZZ	5305-12-141-9850	D8286	DIN933-M6x40-8.8-A2P	. SCREW, CAP, HEXAGON HEAD	1
29	PAFZZ	5305-12-374-9143	D0356	7.306-090.0	. SCREW,CAP,SOCKET HEAD	5

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USUABLE ON CODE (UOC)	(7) QTY
*30	PAFZZ	5310-12-142-0659	D8286	DIN127-B6-FST-A3P	. WASHER, LOCK	5
*31	PAFZZ	6680-12-144-4633	D9089	240SK16M	. INDICATOR, SIGHT,	1
*32	PAFZZ	5310-01-559-8870	39428	90576A118	NUT, SELF-LOCKING	3
*33	PAFZZ	5310-12-142-0481	D8286	DIN125-B10,5-140HV-A3P	WASHER, FLAT	6
34	PAFZZ	5306-12-374-8166	D0356	7.303-252.0	BOLT, EYE	2
35	PAFZZ	5305-12-142-8221	D0356	7.304-118.0	SCREW, CAP, HEXAGON	3
36	PAFZZ	5310-12-156-4996	D0356	7.311-006.0	NUT, PLAIN, HEXAGON	4
*37	PAFZZ	5365-12-381-0471	D0356	5.110-300.0	SPACER, SLEEVE	2
*38	PAFZZ	3030-12-166-2117	D0356	7.348-106.0	BELT, V	1
*TBD	PAFZZ	5340-12-386-3477	D0356	5.132-011.0	CAP, PROTECTIVE	1
					END OF FIGURE	

END OF WORK PACKAGE

FIELD MAINTENANCE
REPAIR PARTS AND SPECIAL TOOLS LIST (RPSTL)
FAN, CENTRIFUGAL

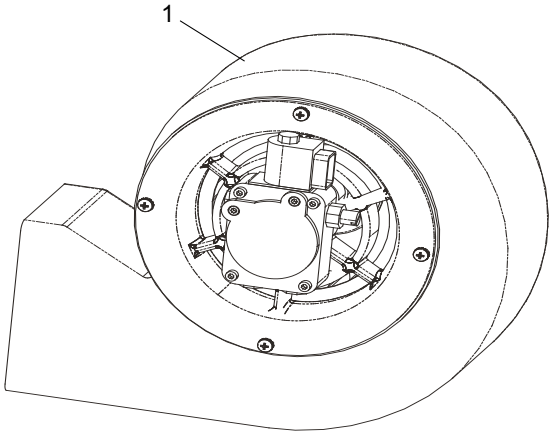


Figure 4. Fan, Centrifugal. (Sheet 1 of 3).

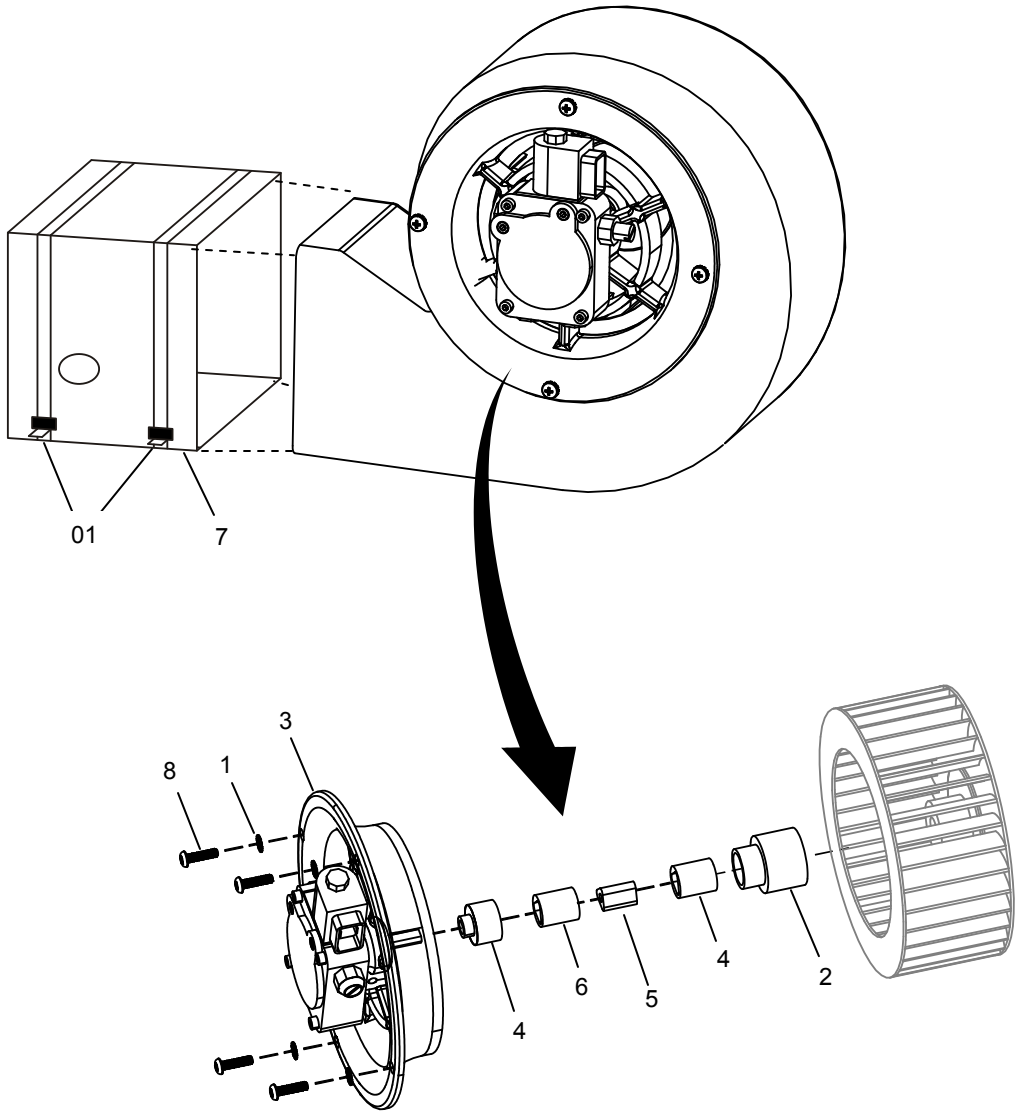


Figure 4. Fan, Centrifugal. (Sheet 2 of 3).

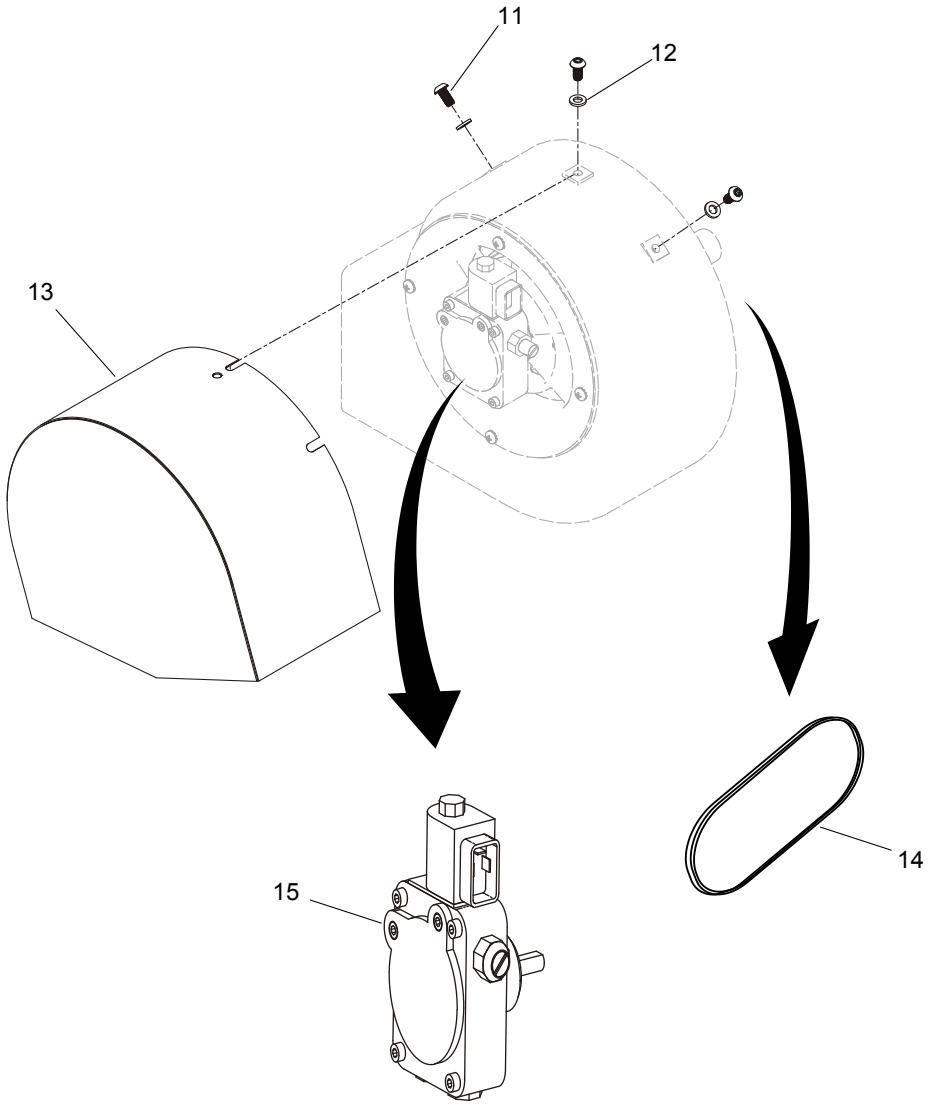


Figure 4. Fan, Centrifugal. (Sheet 3 of 3).

7(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USUABLE ON CODE (UOC)	(7) QTY
					GROUP 0102	
					FIG. 4 FAN, CENTRIFUGAL	
*1	PAFFF	4140-12-375-2293	D0356	2.641-232.0	FAN, CENTRIFUGAL	1
2	PAFZZ	3010-12-331-0768	D0356	6.463-021.0	.COUPLING HALF, SHAFT	1
*3	PAFZZ	ITEM DELETED	D0356	6.463-020.0	.CAP, GREASE	2
*4	PAFZZ	5365-12-330-9207	D0356	5.471-055.0	.SPACER, SLEEVE	1
5	PAFZZ	3040-12-169-2891	D0356	6.463-009.0	.KUPPLUNG	1
*6	PAFZZ	4140-12-330-8398	D0356	5.602-021.0	.HOUSING PART, FAN	1
*7	PAFZZ	5310-12-142-0659	D8286	DIN127-B6-FST-A3P	.WASHER, LOCK	4
*8	PAFZZ	5305-12-374-9143	D0356	7.306-090.0	.SCREW, CAP, SOCKET HE	4
9	PAFZZ	5340-12-371-2188	D0356	6.178-002.0	BOOT, DUST AND MOISTURE	1
*10	PAFZZ	5975-12-329-1919	D0356	6.388-608.0	STRAP, TIEDOWN, ELECTRICAL	2
*11	PAFZZ	5305-12-379-0576	D0356	7.306-071.0	SCREW, MACHINE	3
*12	PAFZZ	5310-12-156-4912	D8286	DIN125-B5,3-140HV-A3P	WASHER, FLAT	3
13	PAFZZ	4140-12-330-8395	D0356	4.392-019.0	COVER, ELECTRICAL FAN	1
14	PAFZZ	3030-12-324-9252	D0356	7.348-072.0	BELT, V	1
15	PAFZZ	4320-12-324-9142	D0356	6.472-382.0	PUMP, ROTARY	1
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END OF WORK PACKAGE

FIELD MAINTENANCE
ELECTRICAL SYSTEM (CONTROL BOX)

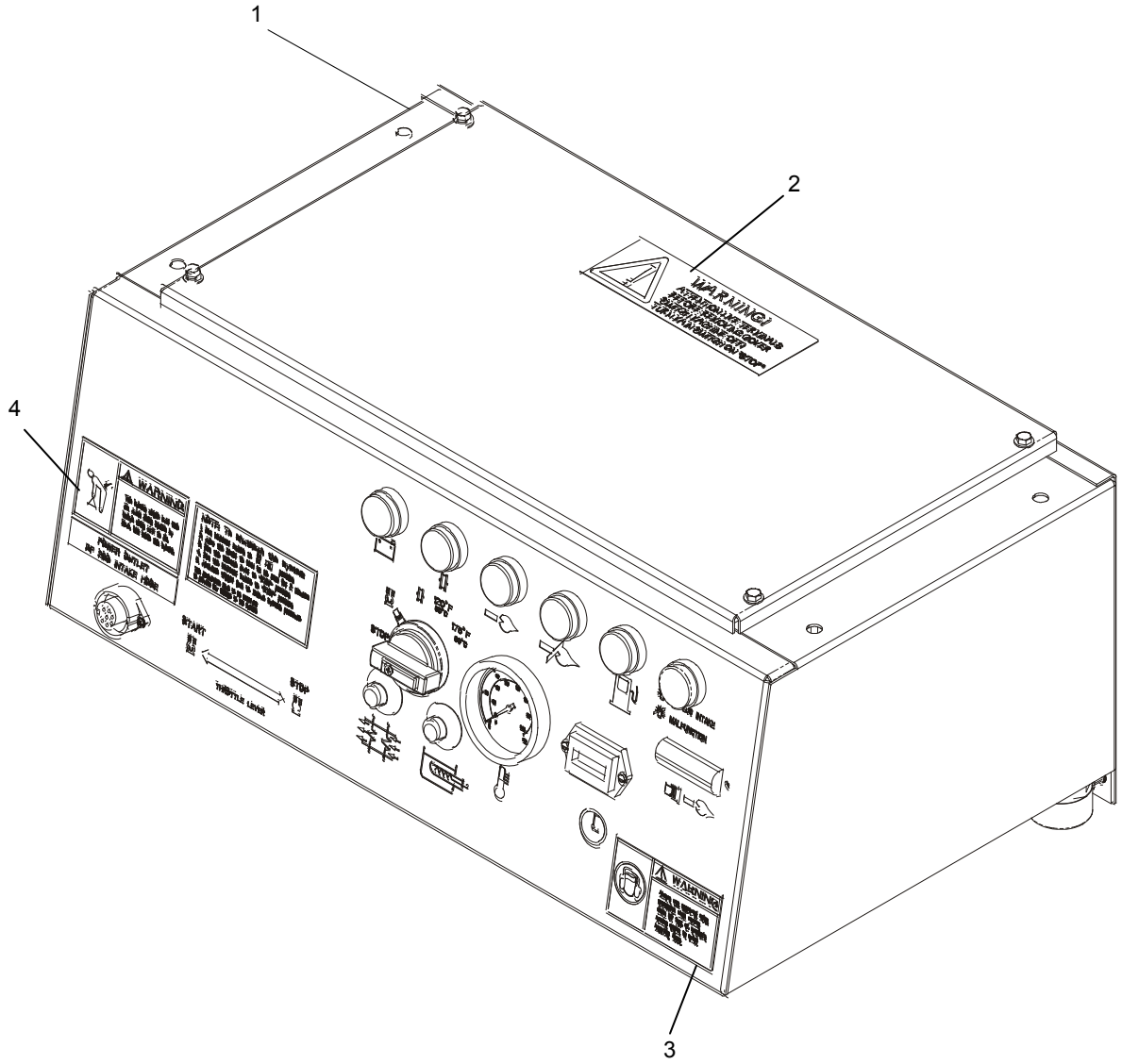


Figure 5. Electrical System. (Sheet 1 of 16).

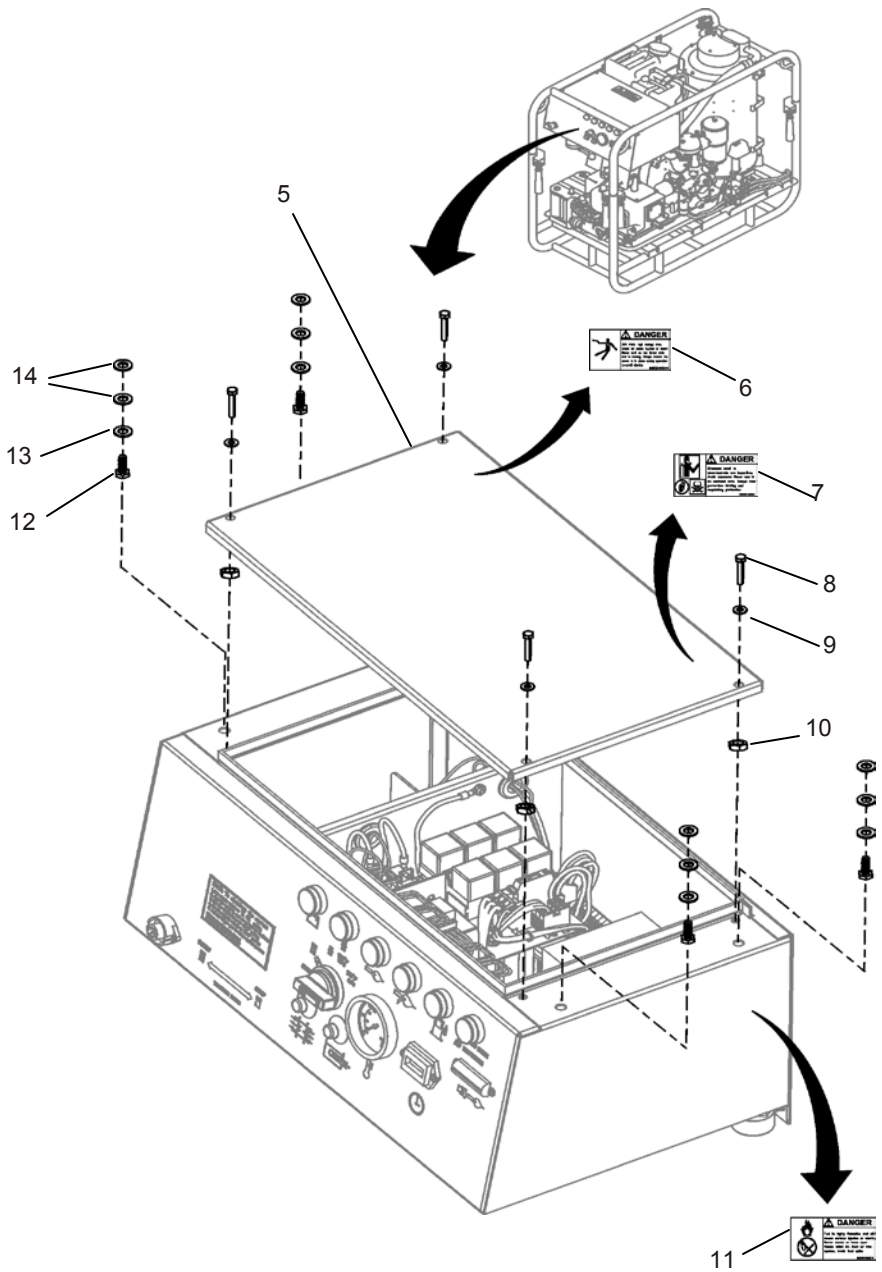


Figure 5. Electrical System. (Sheet 2 of 16).

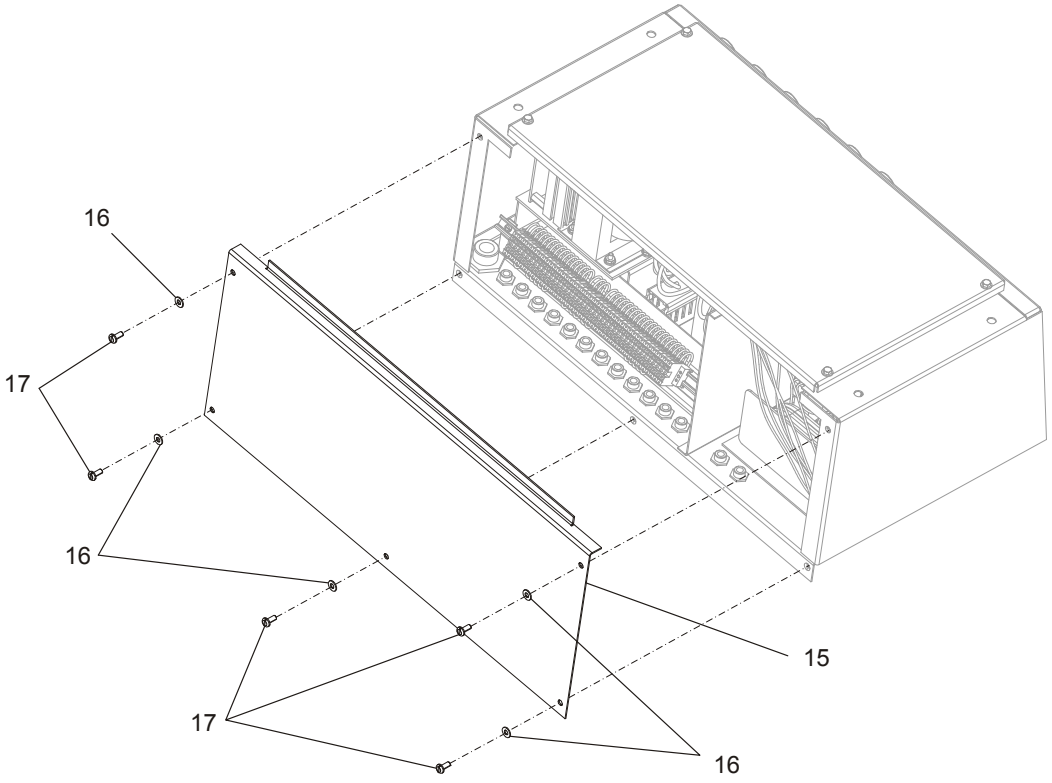
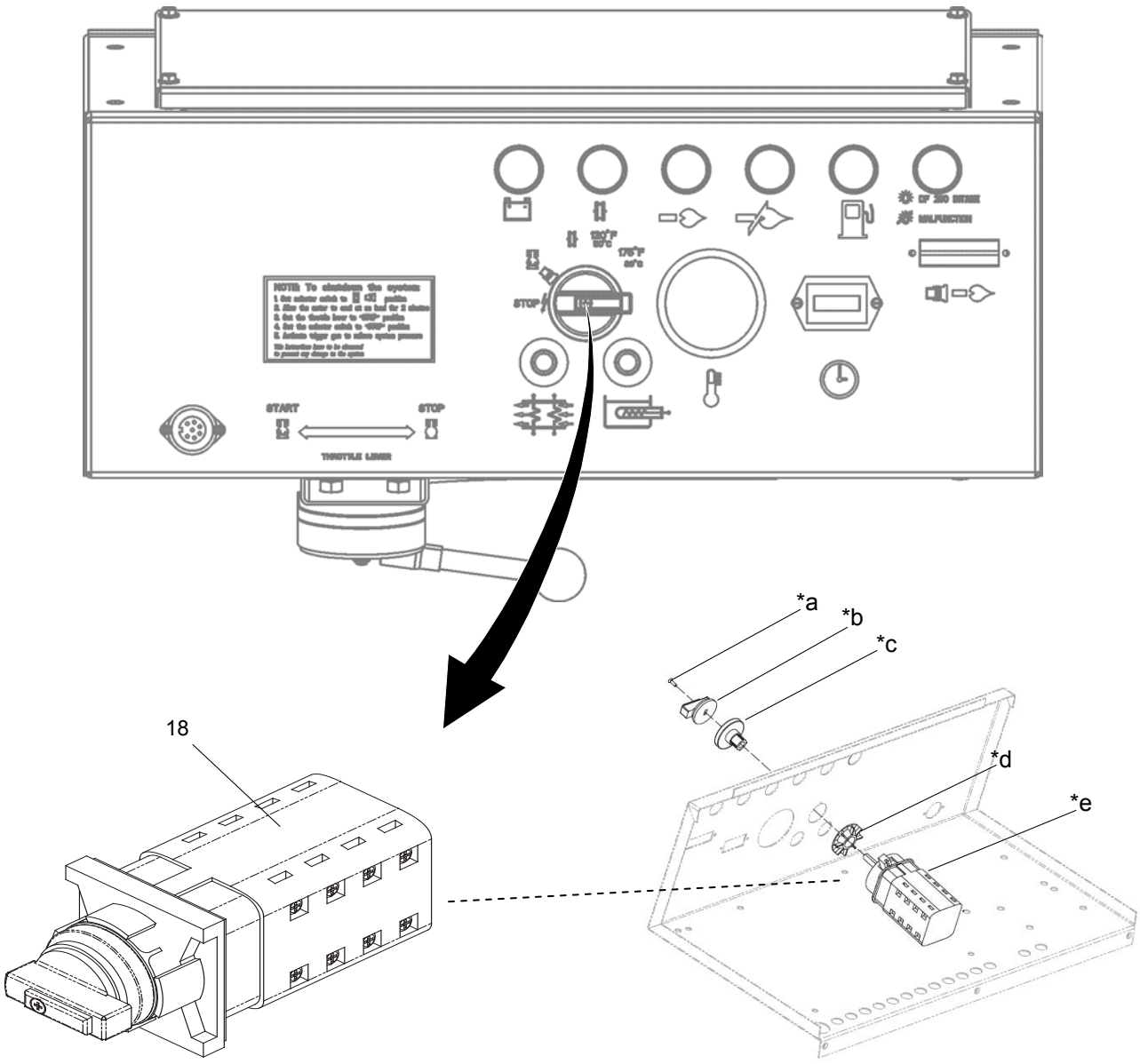
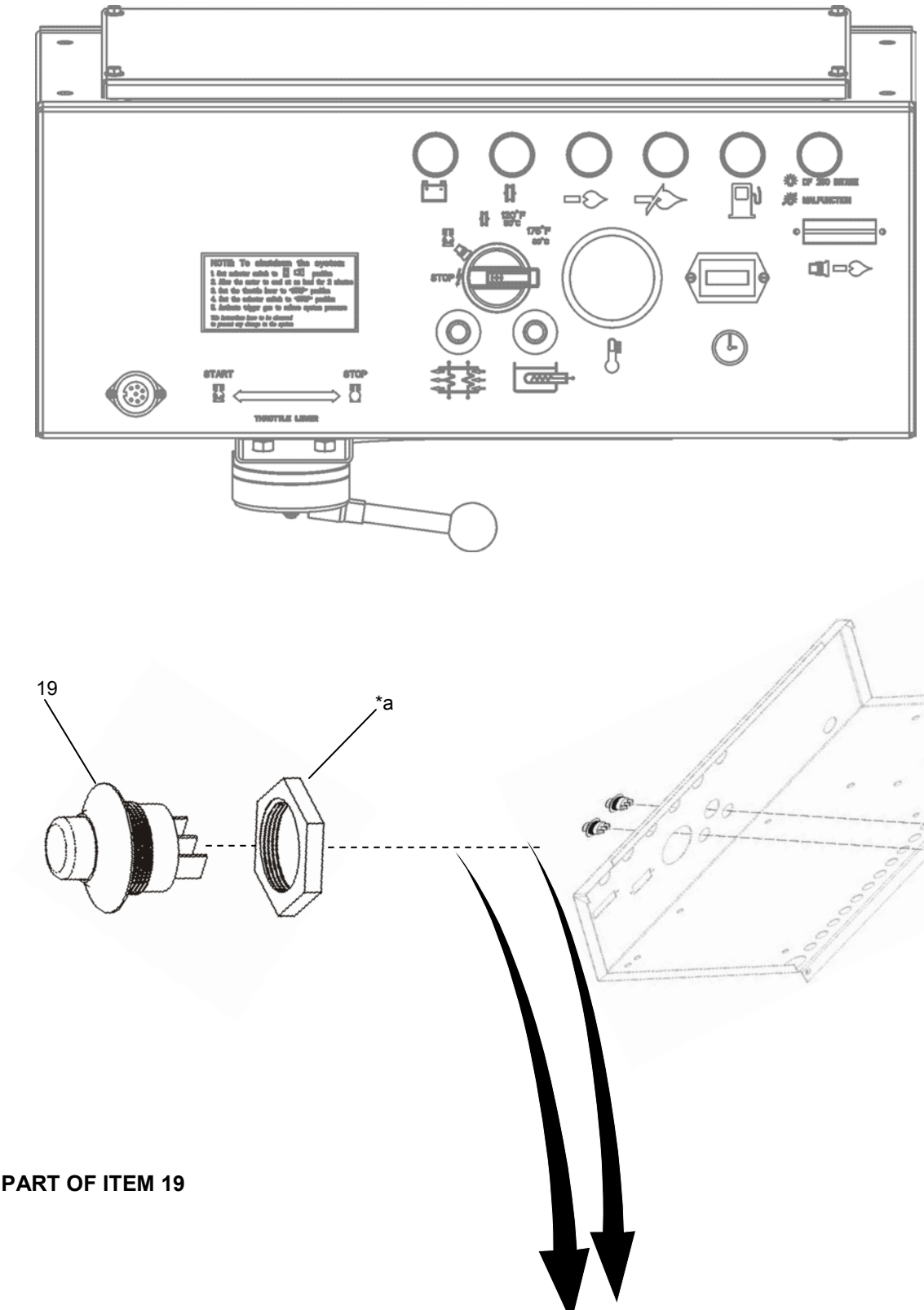


Figure 5. Electrical System. (Sheet 3 of 16 Sheets).



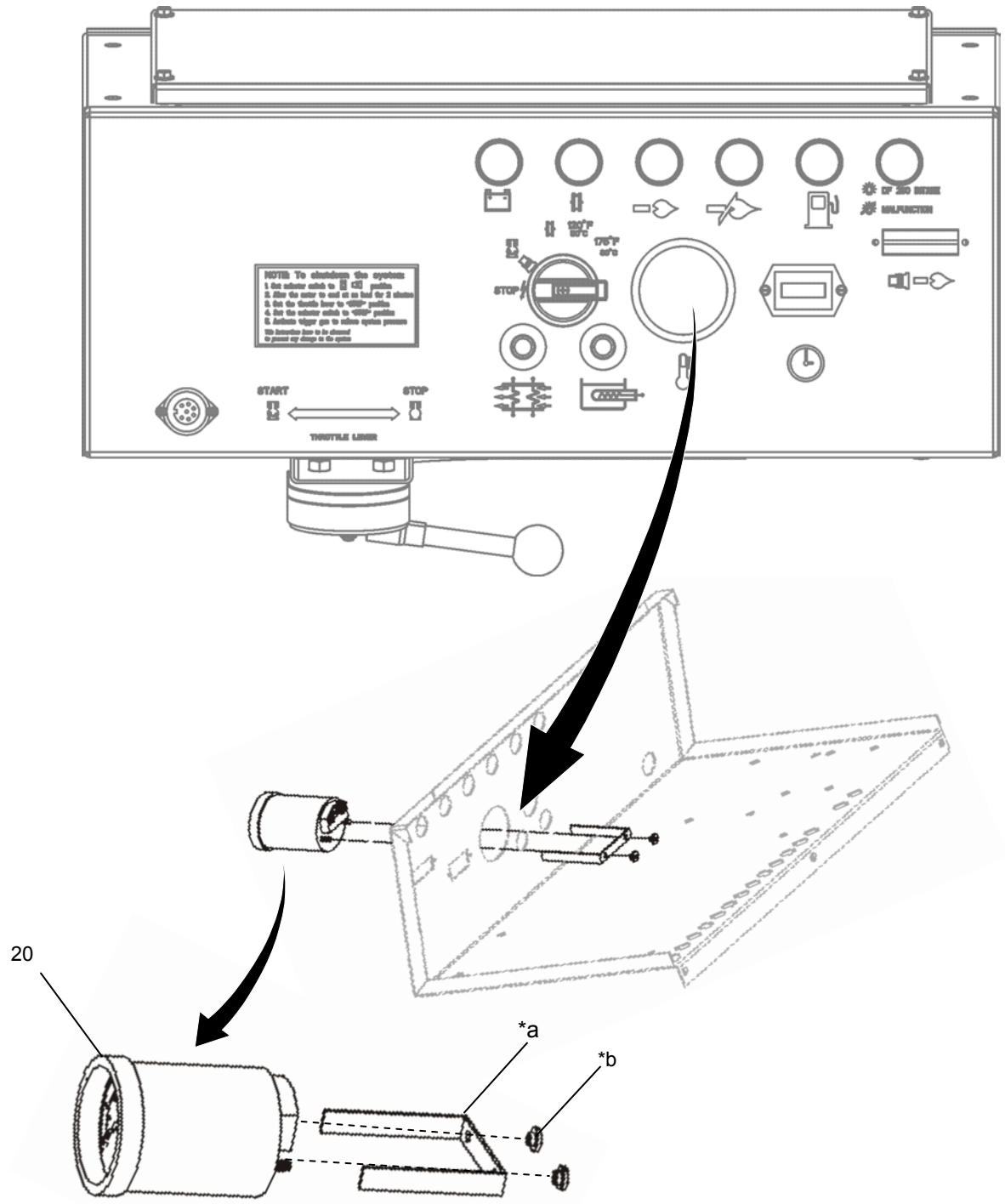
***a PART OF ITEM 18**
***b PART OF ITEM 18**
***c PART OF ITEM 18**
***d PART OF ITEM 18**
***e PART OF ITEM 18**

Figure 5. Electrical System. (Sheet 4 of 16).



***a PART OF ITEM 19**

Figure 5. Electrical System. (Sheet 5 of 16).



*** a PART OF ITEM 20**
*** b PART OF ITEM 20**

Figure 5. Electrical System. (Sheet 6 of 16).

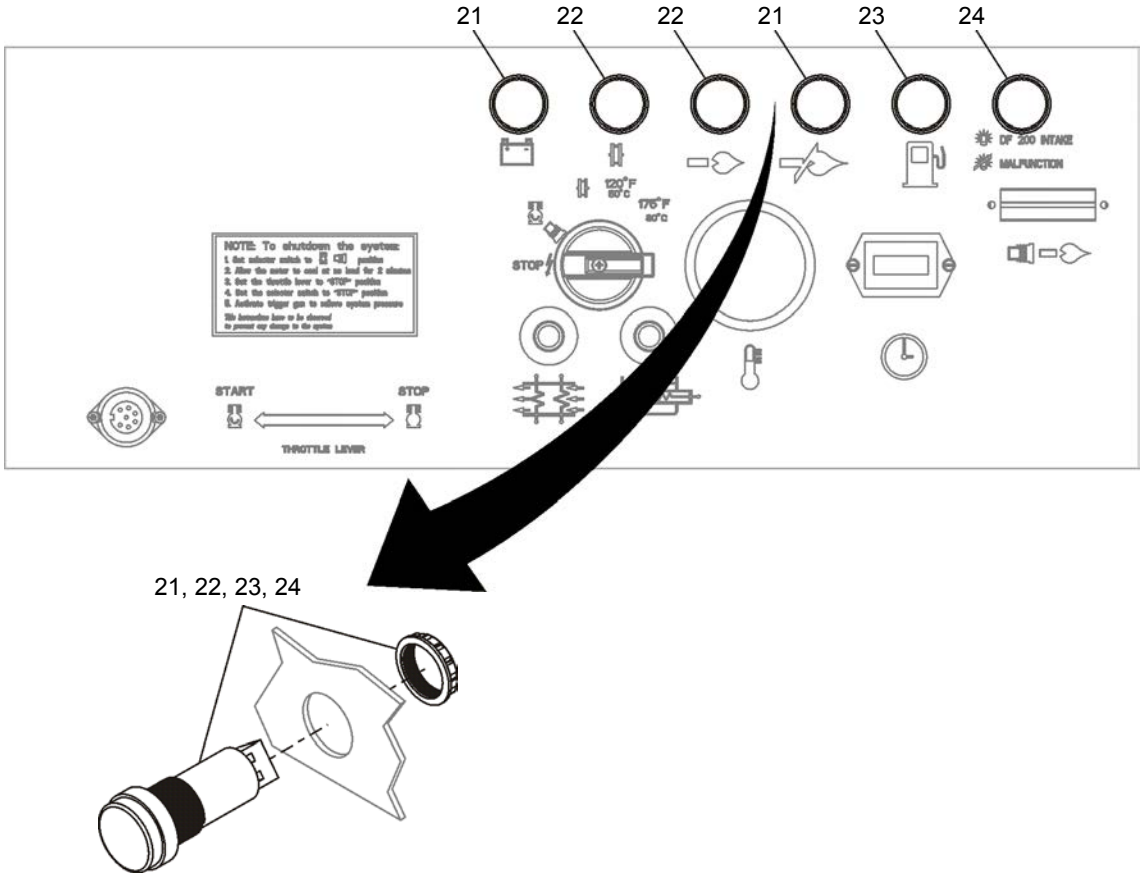


Figure 5. Electrical System. (Sheet 7 of 16).

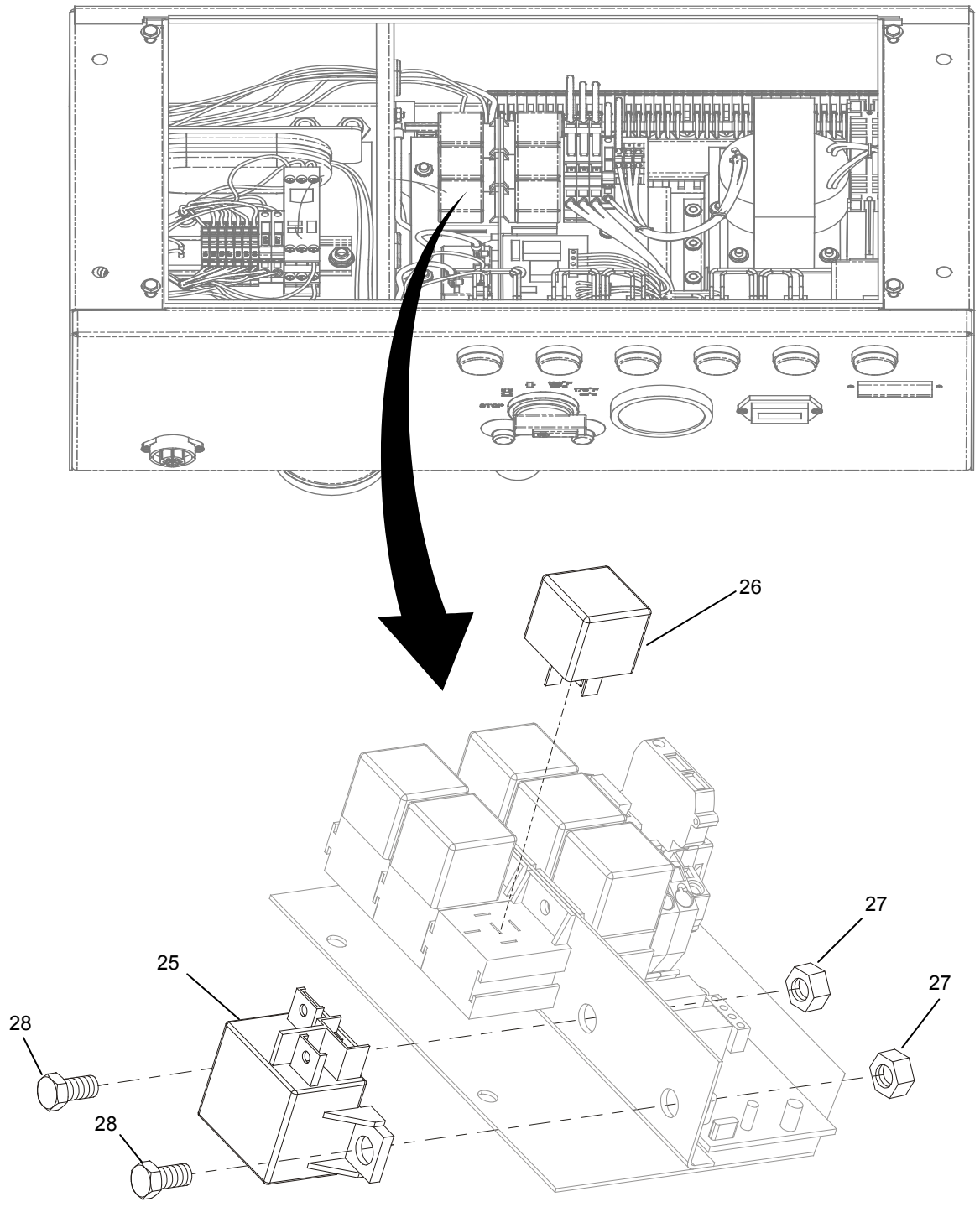


Figure 5. Electrical System. (Sheet 8 of 16).

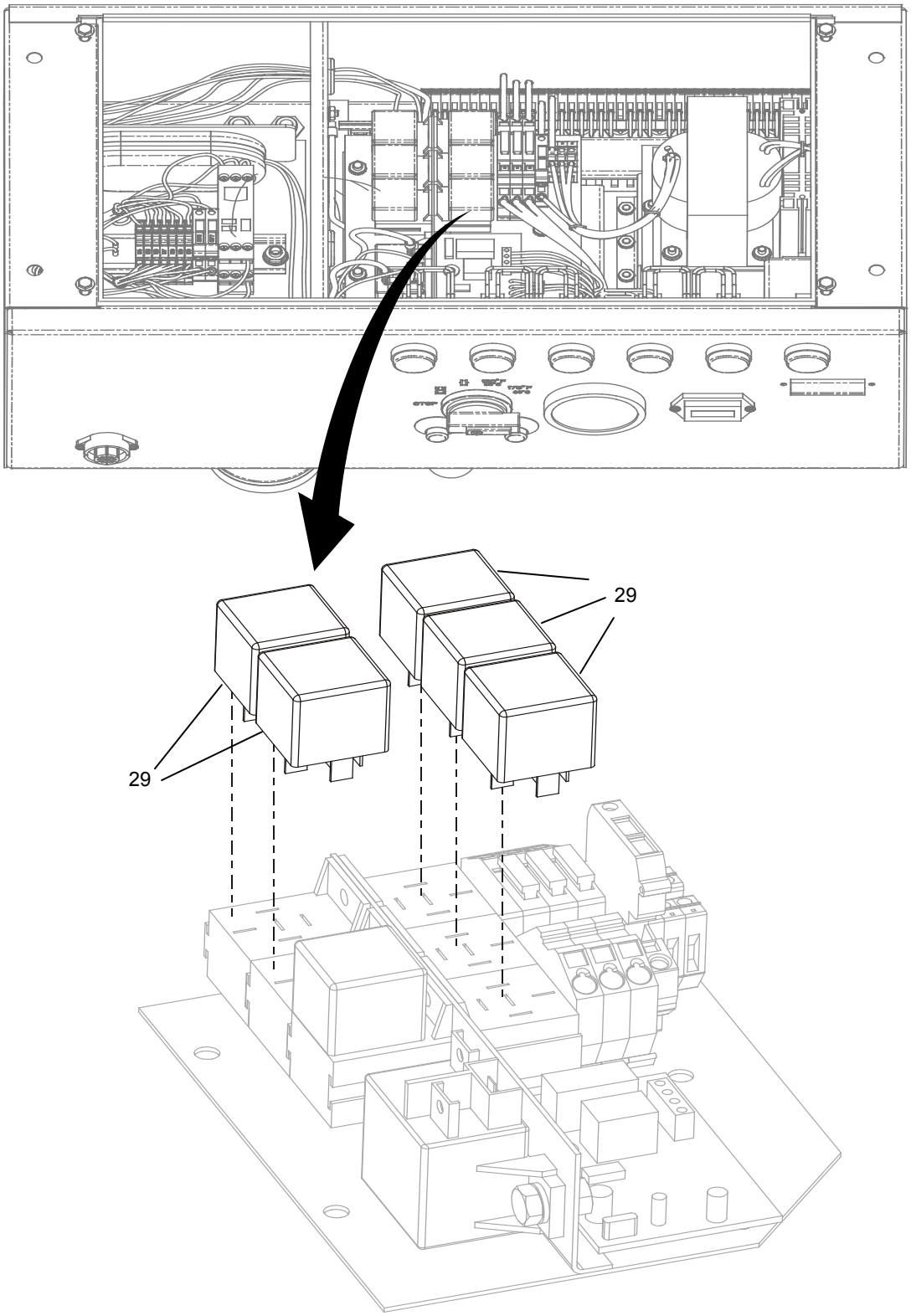


Figure 5. Electrical System. (Sheet 9 of 16).

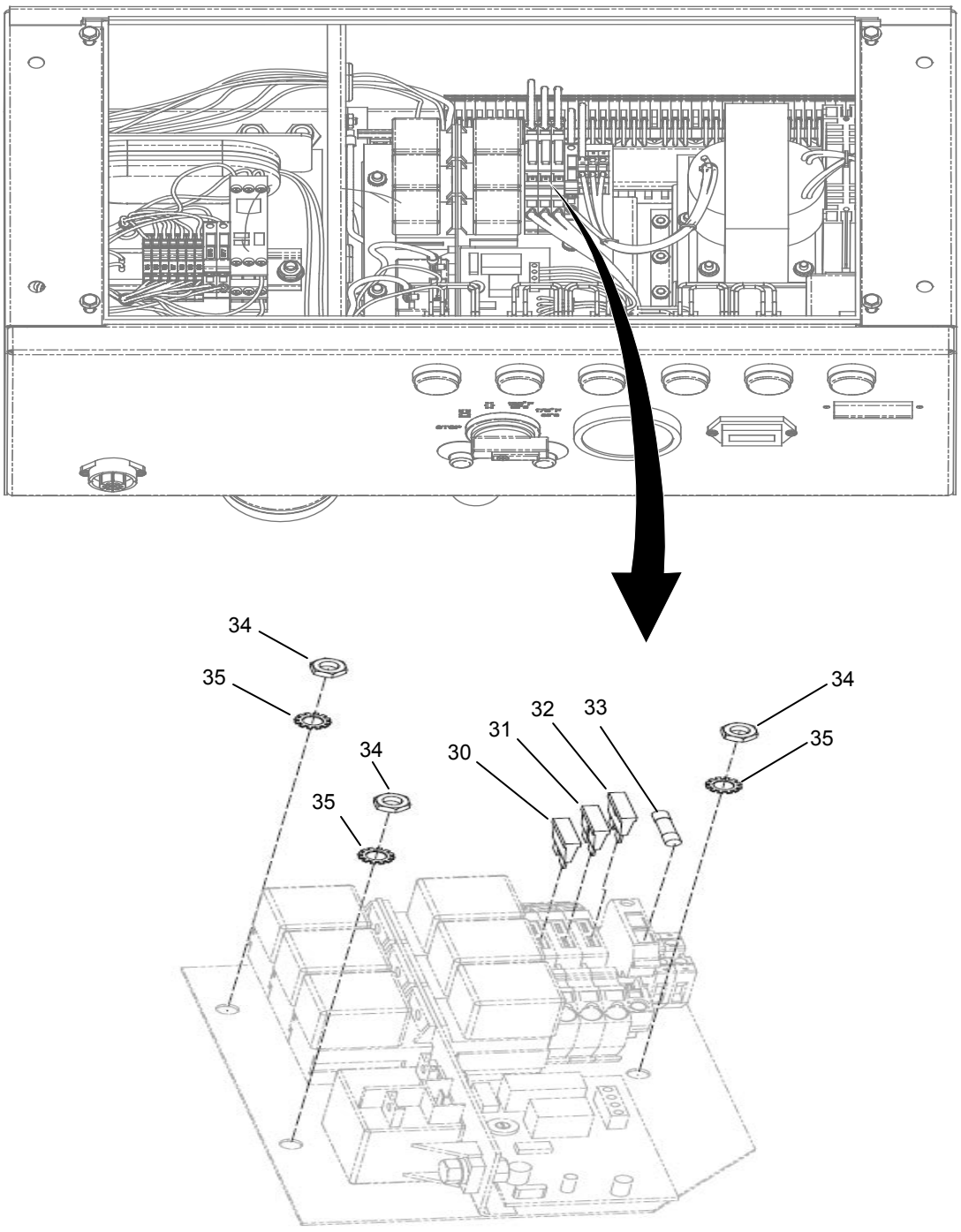


Figure 5. Electrical System. (Sheet 10 of 16).

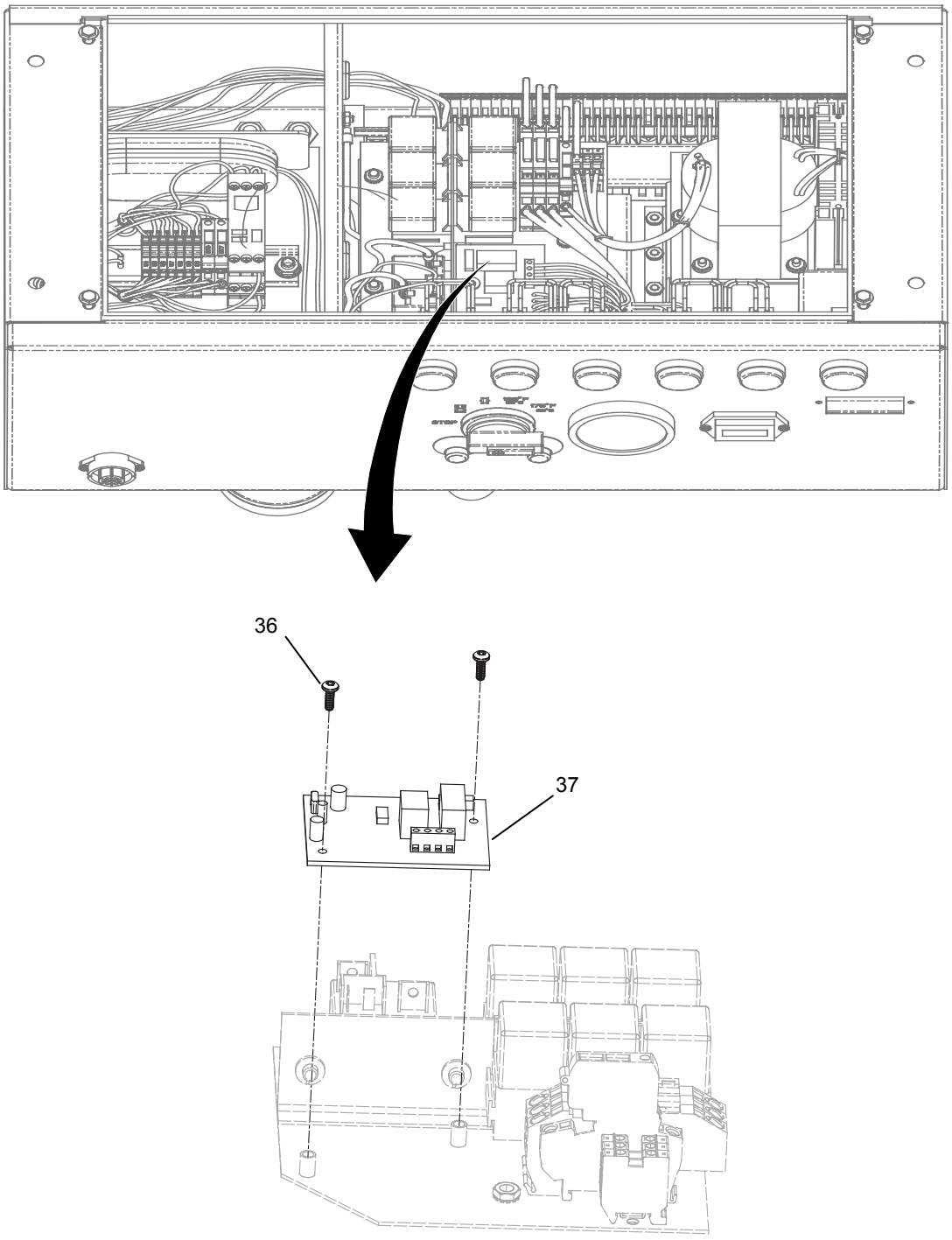
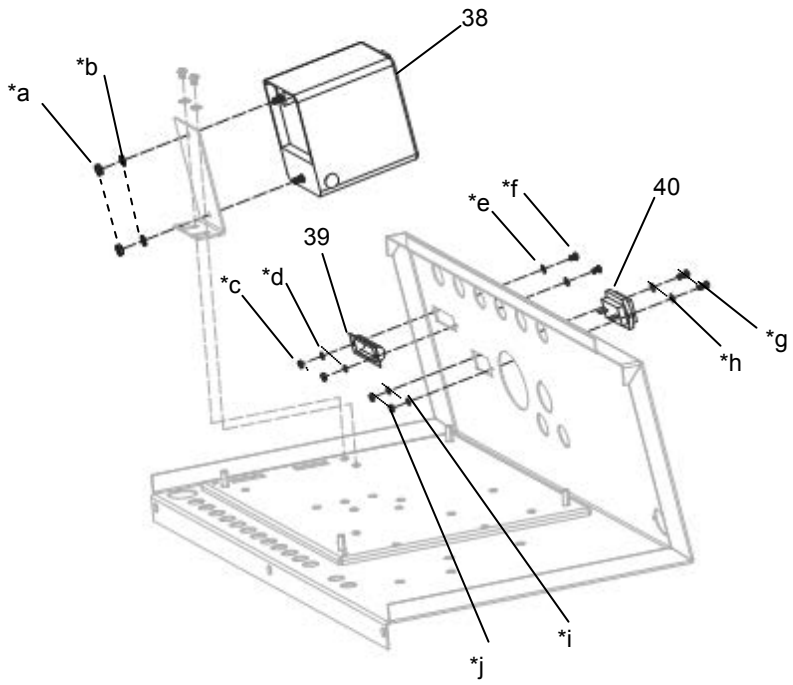


Figure 5. Electrical System. (Sheet 11of 16).



***a PART OF ITEM 38**
***b PART OF ITEM 38**
***c PART OF ITEM 39**
***d PART OF ITEM 39**
***e PART OF ITEM 39**
***f PART OF ITEM 39**
***g PART OF ITEM 40**
***h PART OF ITEM 40**
***I PART OF ITEM 40**
***J PART OF ITEM 40**

Figure 5. Electrical System. (Sheet 12 of 16).

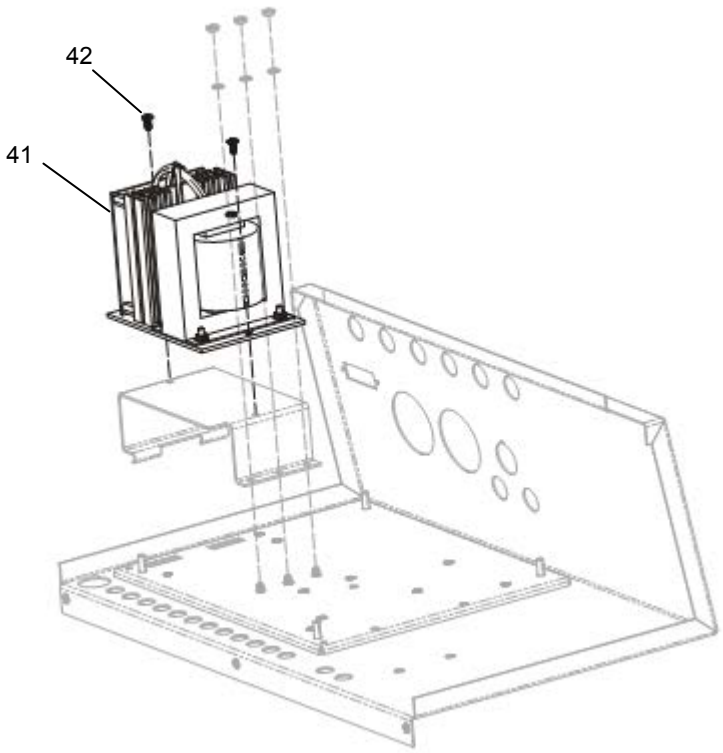


Figure 5. Electrical System. (Sheet 13 of 16).

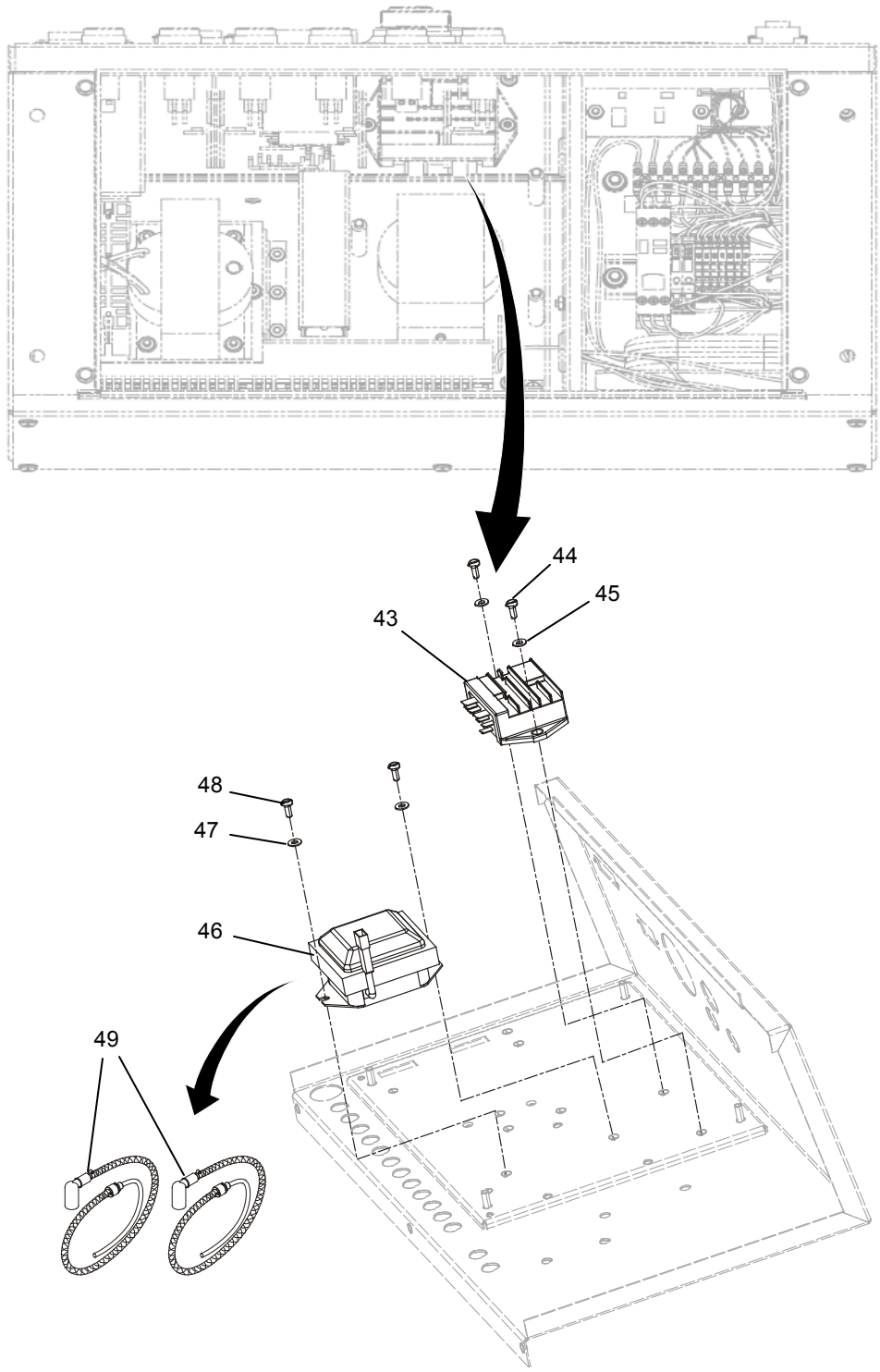


Figure 5. Electrical System. (Sheet 14 of 16)

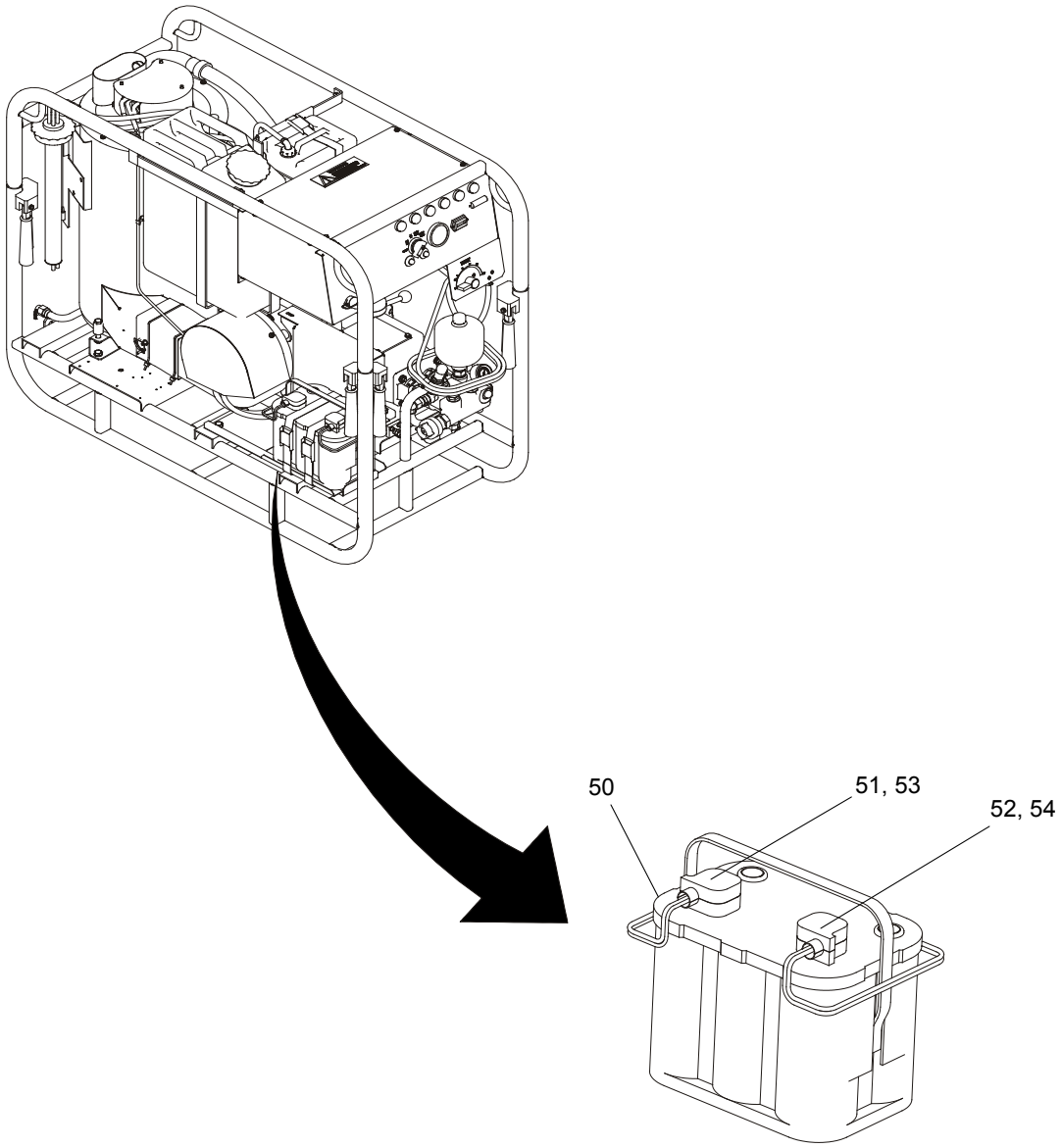


Figure 5. Electrical System. (Sheet 15 of 16).

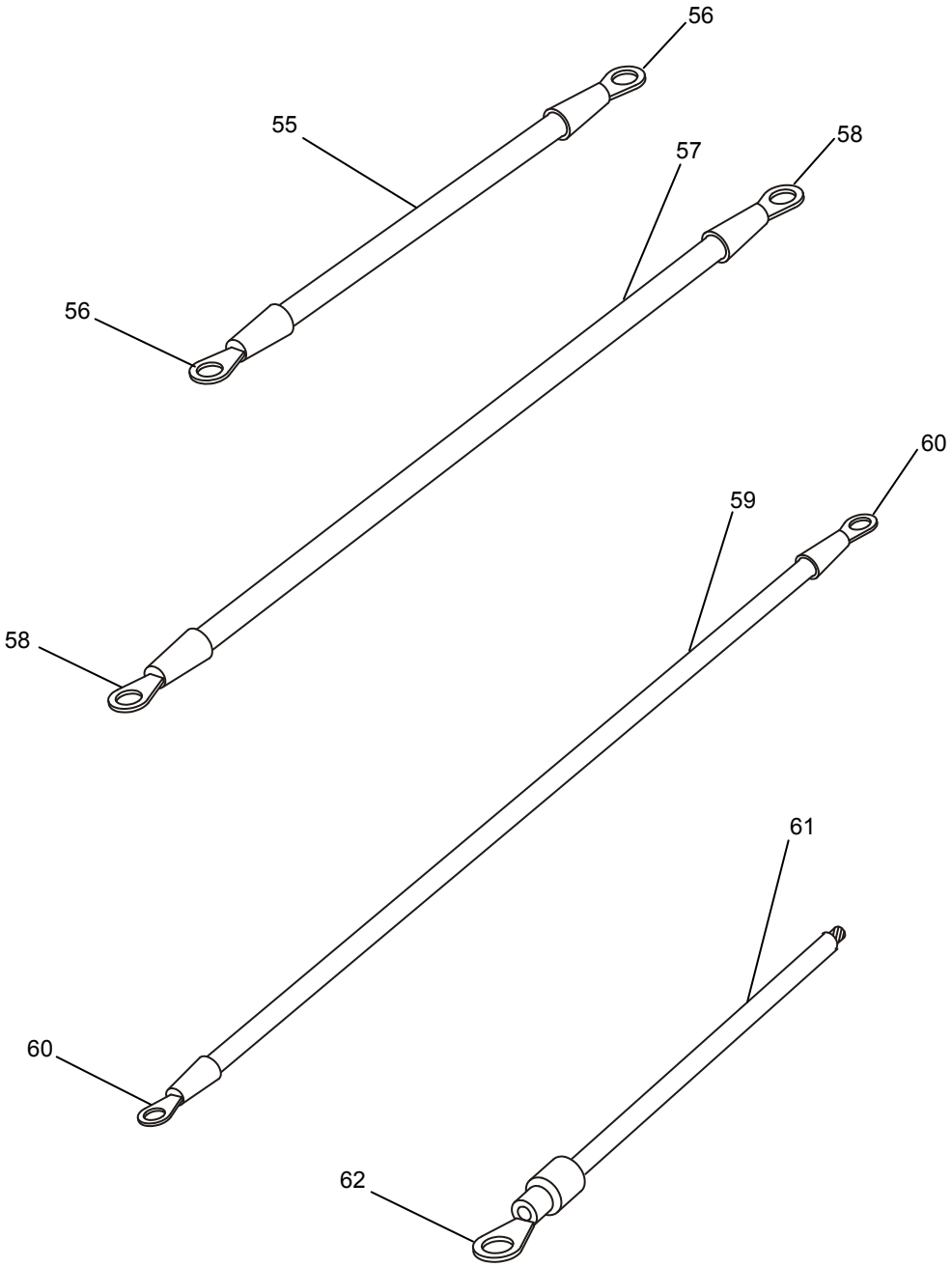


Figure 5. Electrical System. (Sheet 16 of 16)

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USUABLE ON CODE (UOC)	(7) QTY
					GROUP 0103	
					FIG. 5 ELECTRICAL SYSTEM	
*1	PAFDD	6110-12-385-0389	D0356	2.642-077.0	ELECTRICAL ASSEMBLY	1
*2	XBFZZ		D0356	5.383-853.0	.LABEL, WARNING	1
*3	XBFZZ		98255	91159	.LABEL, HEARING DAMAGE	1
*4	XBFZZ		98255	91153	.LABEL, SYSTEM WEIGHT	1
5	PAFZZ	5340-12-351-7593	D0356	5.063-281.0	.COVER, ACCESS	1
*6	XBFZZ		98255	91154	.LABEL, 220 VOLTS	1
*7	XBFZZ		98255	91151	.LABEL, CHEMICALS	1
*8	PAFZZ	5305-01-581-7719	39428	91280A238	.SCREW, CAP, HEXAGON	4
*9	PAFZZ	5310-12-168-9828	D0356	7.312-278.0	.WASHER, FLAT	9
*10	PAFZZ	5310-01-581-0440	39428	90576A104	.NUT, SELF-LOCKING, HEX	4
*11	XBFZZ		98255	91150	.LABEL, FUEL FLAMMABLE	2
*12	PAFZZ	5305-12-141-9850	D8286	DIN933-M6x40-8.8-A2P	. SCREW, CAP, HEXAGON	4
*13	PAFZZ	5310-12-142-0658	D8286	DIN127-B8-FST-A3P	.WASHER, LOCK	4
*14	PAFZZ	5310-12-142-0645	19206	12529588	.WASHER, FLAT	8
15	PAFZZ	5340-12-374-7007	D0356	5.063-282.0	.COVER ,ACCESS	1
*16	PAFZZ	ITEM DELETED	D0356	7.312-278.0	.WASHER, FLAT	5
*17	PAFZZ	5305-12-374-7667	D0356	7.303-036.0	.SCREW, CAP, SOCKET HE	9
18	PAFZZ	5930-12-374-6556	D0356	6.986-685.0	.SWITCH ROTARY	1
19	PAFZZ	5930-12-144-4621	D0356	6.631-017.0	.SWITCH, PUSH	2
20	PAFZZ	6685-12-374-6574	D0356	6.686-403.0	.REGULATOR, TEMPERATURE	1
21	PAFZZ	5980-12-374-8043	D0356	6.666-678.0	.LIGHT EMITTING DIODE RED	2
22	PAFZZ	5980-12-374-7568	D0356	6.666-677.0	.LIGHT EMITTING DIODE WHITE	2
23	PAFZZ	5980-12-374-6611	D0356	6.666-679.0	.LIGHT EMITTING DIODE YELLOW	1
*24	XBFZZ	ITEM DELETED	D0356	6.666-758.0	LIGHT EMITTING DIODE GREEN	1
25	PAFZZ	5945-12-306-6516	D0356	6.632-065.0	.RELAY, ELECTROMAGNETIC	1
26	PAFZZ	5945-12-339-5010	D0356	6.633-216.0	.RELAY, ELECTROMAGNETIC	1
*27	PAFZZ	5310-12-156-4991	S3465	4536226-786	.NUT, PLAIN HEXAGON	5
*28	PAFZZ	5305-12-381-2088	D0356	7.306-089.0	.SCREW, CAP, SOCKET HE M6x12-8.8	2
29	PAFZZ	5945-12-312-9977	D0356	6.633-217.0	.RELAY, ELECTROMAGNETIC	5
30	PAFZZ	5920-12-198-4234	D0356	7.644-007.0	.FUSE, ENCLOSED LINK 7.5 AMP	1
31	PAFZZ	5920-12-308-4126	D0356	7.644-005.0	.FUSE, ENCLOSED LINK 20 AMP	1
32	PAFZZ	5920-12-313-0640	D0356	7.644-012.0	.FUSE, ENCLOSED LINK 25 AMP	1

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USUABLE ON CODE (UOC)	(7) QTY
*33	PAFZZ	5920-12-124-7829	D0356	6.644-052.0	.FUSE, CARTRIDGE 2 AMP	1
*34	PAFZZ	ITEM DELETED	D0356	7.311-003.0	.NUT, PLAIN, HEX	3
*35	XDFZZ	5310-12-374-9182	D0356	7.312-167.0	.WASHER, LOCK	3
*36	PADZZ	ITEM DELETED	39428	92832A225	.SCREW, CAP, SOCKET	2
*37	PAFZZ	ITEM DELETED	D0356	6.633-109.0	.PULSE GENERATOR	1
38	PAFZZ	5945-12-324-5690	D0356	6.633-221.0	.RELAY, THERMAL	1
39	PAFZZ	5340-12-330-8235	D0356	6.646-046.0	.COVER, ACCESS	1
*40	PAFZZ	6645-12-374-6600	D0356	6.666-671.0	.METER, TIME TOTALIZING	1
*41	PAFZZ	6130-12-331-1721	D0356	6.621-025.0	.INVERTER, POWER, STAT	1
*42	PAFZZ	ITEM DELETED	D0356	7.303-036.0	.SCREW, M5X8	2
*43	PAFZZ	2920-12-374-7995	D8889	547.469.1	.REGULATOR, ENGINE	1
44	PAFZZ	5305-12-351-3680	D0356	7.303-039.0	.SCREW, TAPPING	2
*45	PAFZZ	5310-12-156-4912	D0356	DIN125-B5,3-140HV-A3P	.WASHER, FLAT	4
46	PAFZZ	5950-12-331-1526	D0356	6.622-100.0	.TRANSFORMER, POWER	1
*47	PAFZZ	ITEM DELETED	D0356	7.312-002.0	.WASHER, FLAT	2
*48	PAFZZ	ITEM DELETED	D0356	7.303-036.0	.SCREW, M5X8	2
49	PAFZZ	2920-12-374-6569	D0356	4.821-049.0	.LEAD, IGNITION ENGINE	2
*50	PCFZZ	6140-01-378-8232	OUJ55	8002-002/MDL NO.34	BATTERY, STORAGE	1
51	PAFZZ	5940-12-120-8177	D0356	6.654-008.0	TERMINAL, LUG (POS)	1
52	PAFZZ	5940-12-120-8178	D0356	6.654-009.0	TERMINAL, LUG (NEG)	1
*53	PAFZZ	6160-12-349-6564	D0356	6.642-059.0	SHEILD, BATTERY POST (POS)	2
*54	PAFZZ	ITEM DELETED	D8015	1180558002	SHEILD, BATTERY POST (NEG)	1
*55	MFFZZ	6145-00-177-4677	2W733	31502	WIRE, ELECTRICAL MAKE FROM	3
*56	PAFZZ	5940-00-115-0775	81343	MS20659-174	TERMINAL LUG	6
*57	MOFZZ	ITEM DELETED	39428	6948K713	WIRE, ELECTRICAL	1
*58	PAFZZ	ITEM DELETED	39428	7106K94	TERMINAL, LUG	2
*59	MFFZZ	ITEM DELETED	39428	6948K713	WIRE, ELECTRICAL	1
*60	PAFZZ	ITEM DELETED	39428	7106K94	TERMINAL LUG	2
*61	MFFZZ		39428	71245K54	WIRE, ELECTRICAL	1
62	PAFZZ	5940-01-574-3922	39428	7113K826	TERMINAL LUG	1
*TBD	XDFZZ		34669	10902B	.PLUG, RUBBER – THIS PLUG WILL BE USED IF THE 6.666-758.0 LIGHT NEEDS TO BE REPLACED	1
*TBD	MFFZZ	6145-01-020-1095	81343	GPT 10 AWG RED	WIRE, ELECTRICAL	1
					END OF FIGURE	

END OF WORK PACKAGE

FIELD MAINTENANCE
WATER PIPING SYSTEM

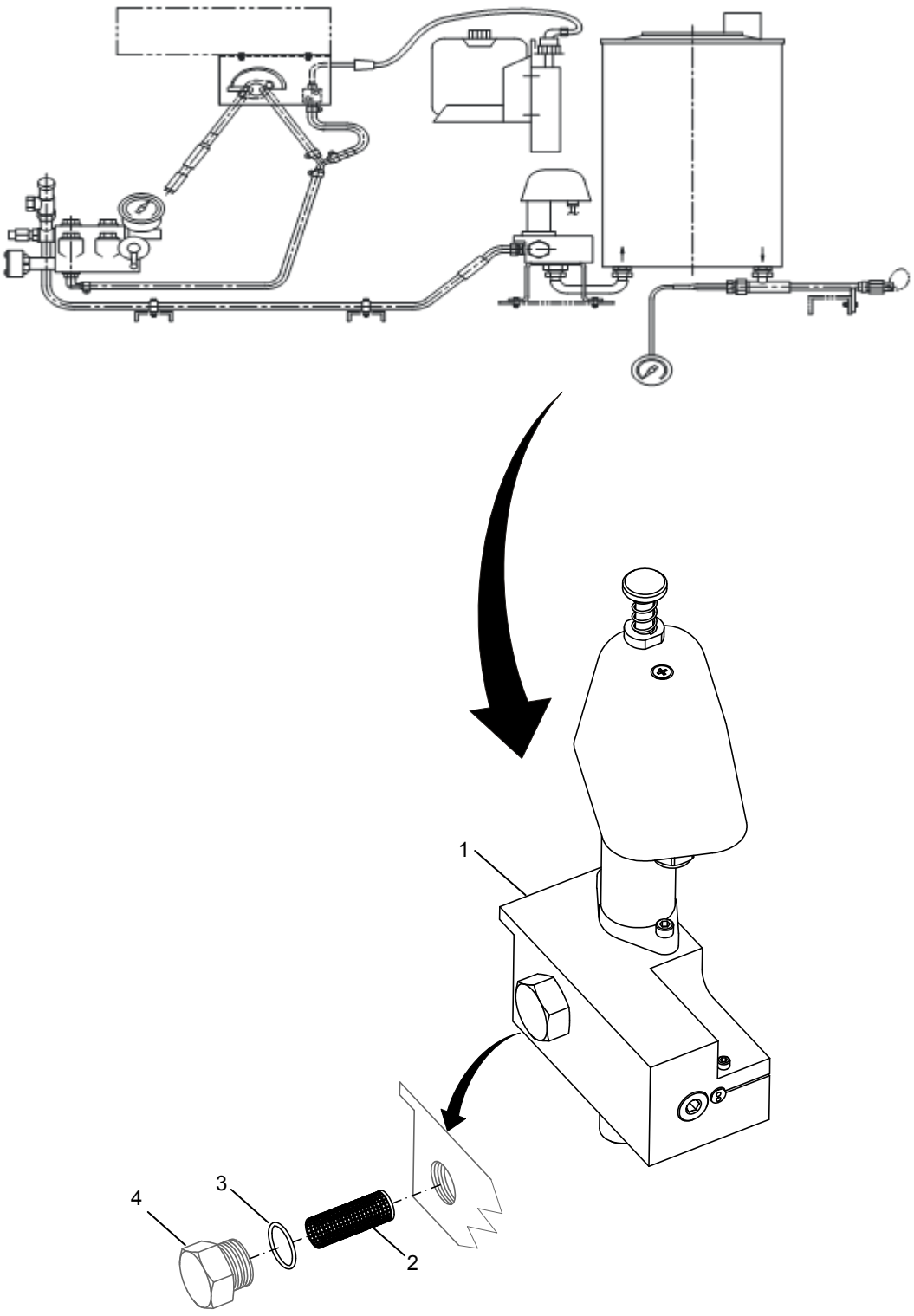


Figure 6. Water Piping System. (Sheet 1 of 5).

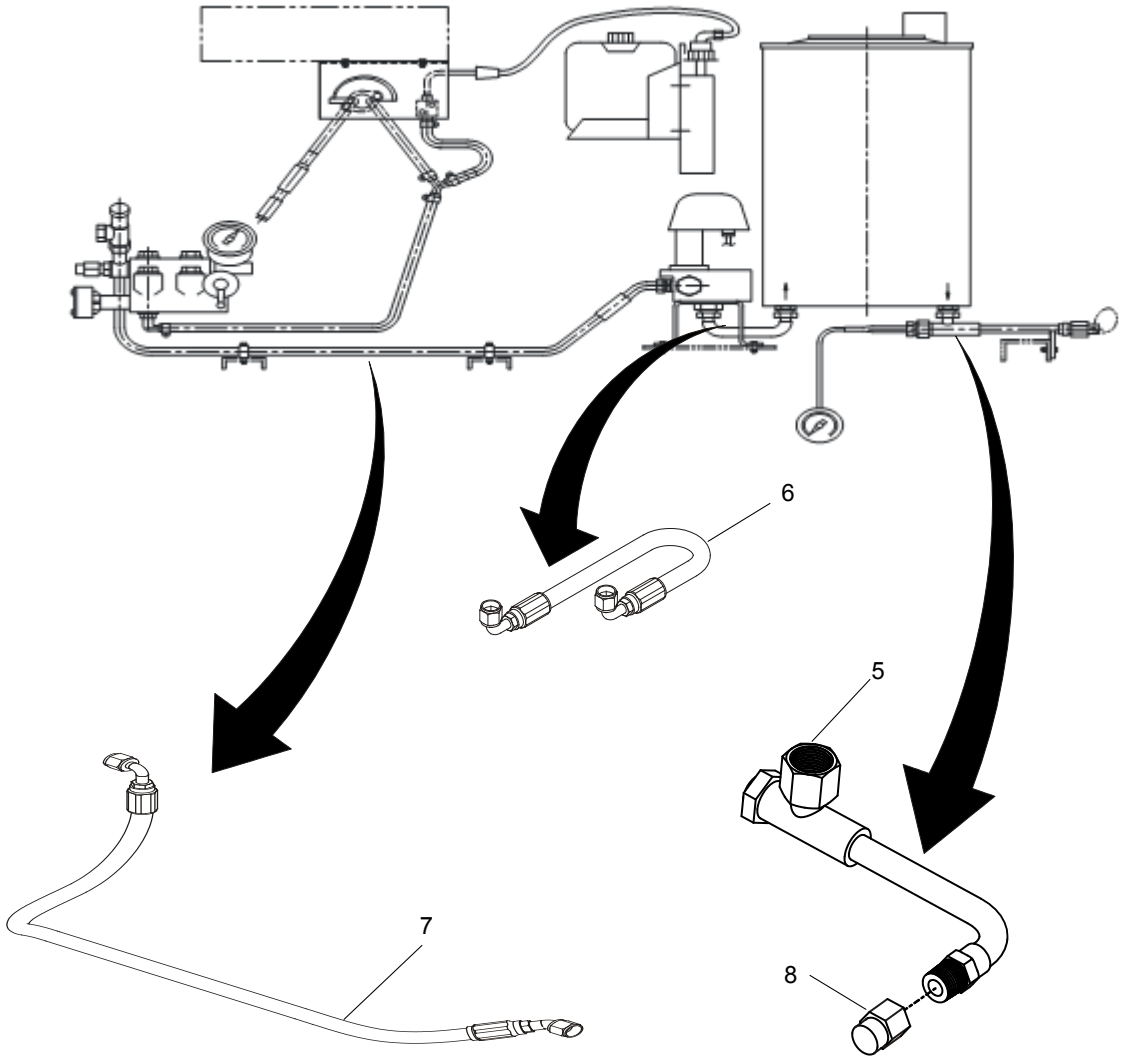


Figure 6. Water Piping System. (Sheet 2 of 5).

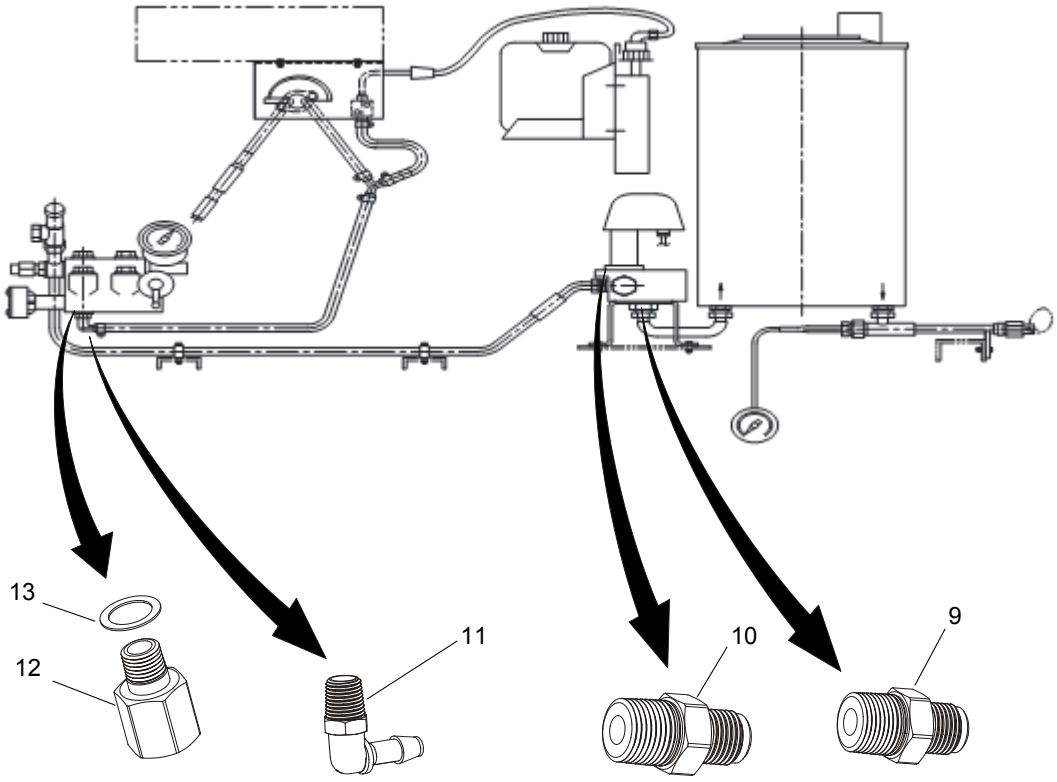


Figure 6. Water Piping System. (Sheet 3 of 5).

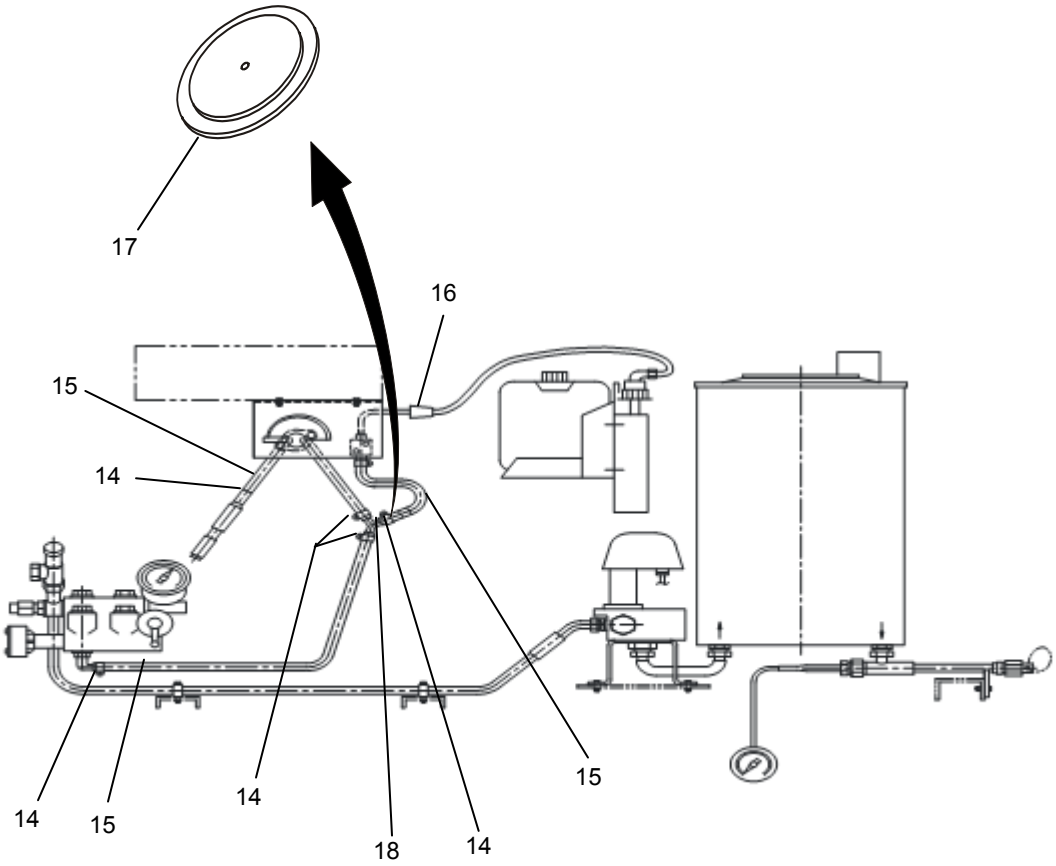


Figure 6. Water Piping System. (Sheet 4 of 5).

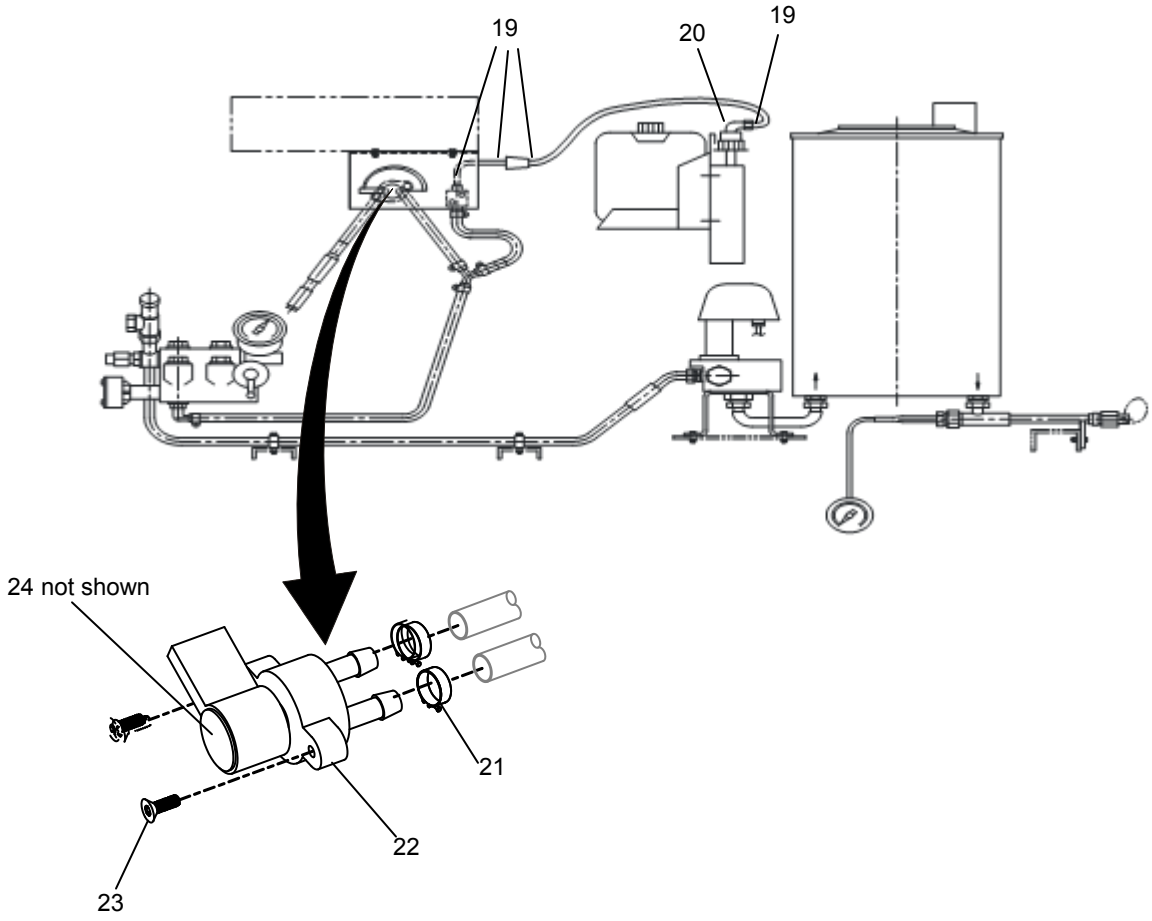


Figure 6. Water Piping System. (Sheet 5 of 5).

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USUABLE ON CODE (UOC)	(7) QTY
					GROUP 0104	
					FIG. 6 WATER PIPING SYSTEM	
*1	PAFZZ	5930-12-376-6359	D0356	4.749-178.0	SWITCH ASSEMBLY	1
*2	PAFZZ	4730-12-379-4470	D0356	6.414-821.0	STRAINER, ELEMENT SE	1
3	PAFZZ	5331-12-379-2144	D0356	6.363-298.0	O-RING SEAL 17, 3 X 2,4	1
4	XBFZZ		D0356	5.411-176.0	SCREW PLUG	1
5	PAFZZ	4710-12-374-8092	D0356	4.421-981.0	TUBE, ASSEMBLY, METAL	1
6	PAFZZ	4720-12-374-7134	D0356	6.391-449.0	HOSE ASSEMBLY, NONMETALLIC	1
7	PAFZZ	4720-12-374-9049	D0356	6.391-378.0	HOSE ASSEMBLY, NONMETALLIC	1
8	PAFZZ	4730-12-376-6228	D0356	4.412-004.0	TAILPIECE, UNION	1
9	PAFZZ	5310-12-196-5816	D0356	7.311-155.0	NUT, PLAIN HEXAGON	1
*10	PAFZZ	4730-12-374-8020	D8286	DIN7631-12-X6CRNIMOTI 17-12-2	NIPPLE TUBE	1
*11	PAFZZ	4730-12-309-0320	D0356	6.388-423.0	ELBOW, HOSE TO BOSS	1
12	PAFZZ	4820-12-309-2768	D0356	4.580-036.0	VALVE, SAFETY RELIEF	1
*13	PAFZZ	5330-12-350-0550	D0356	5.574-027.0	GASKET	1
14	PAFZZ	4730-12-351-3174	D0356	6.388-544.0	CLAMP, HOSE	5
*15	PAFZZ	4720-12-374-7104	D0356	6.391-373.0	TUBING, NONMETALLIC	3
16	PAFZZ	2910-12-166-8646	D0356	6.414-413.0	FILTER, FLUID	1
17	PAFZZ	4730-12-331-1874	D0356	5.131-019.0	RESTRICTOR, FLUID	1
18	PAFZZ	4730-12-374-6352	D0356	6.391-377.0	ELBOW, HOSE	1
*19	PAFZZ	4730-12-374-6282	D0356	6.388-537.0	CLAMP, HOSE	4
*20	PAFZZ	4720-12-374-8125	D0356	4.006-011.0	HOSE ASSEMBLY, NON ME	1
21	PAFZZ	4730-12-339-2836	D0356	6.388-559.0	CLAMP, HOSE	2
22	PAFZZ	4820-12-351-0948	D0356	4.580-147.0	VALVE, SAFETY RELIEF	1
*23	PAFZZ	5305-01-581-0369	39428	91420A126	SCREW, MACHINE	2
24	PAFZZ	5305-12-156-4872	D0356	7.304-415.0	SCREW, CAP, HEXAGON	1
*TBD	XBFZZ	4730-12-324-0555	D0356	6.414-136.0	FILTER, INTAKE	1
*TBD	XBFZZ	4720-12-305-2470	D0356	6.388-225.0	HOSE	1
*TBD	XDFZZ		D0356	6.388-196.0	PVC HOSE	1
*TBD	XDFZZ	4710-12-375-2751	D0356	5.025-747.0	TUBE	1
*TBD	PAFZZ	4720-12-375-2930	D0356	6.388-192.0	HOSE, NONMETALIC	2
					END OF FIGURE	

END OF WORK PACKAGE

FIELD MAINTENANCE
FUEL PIPING ASSEMBLY

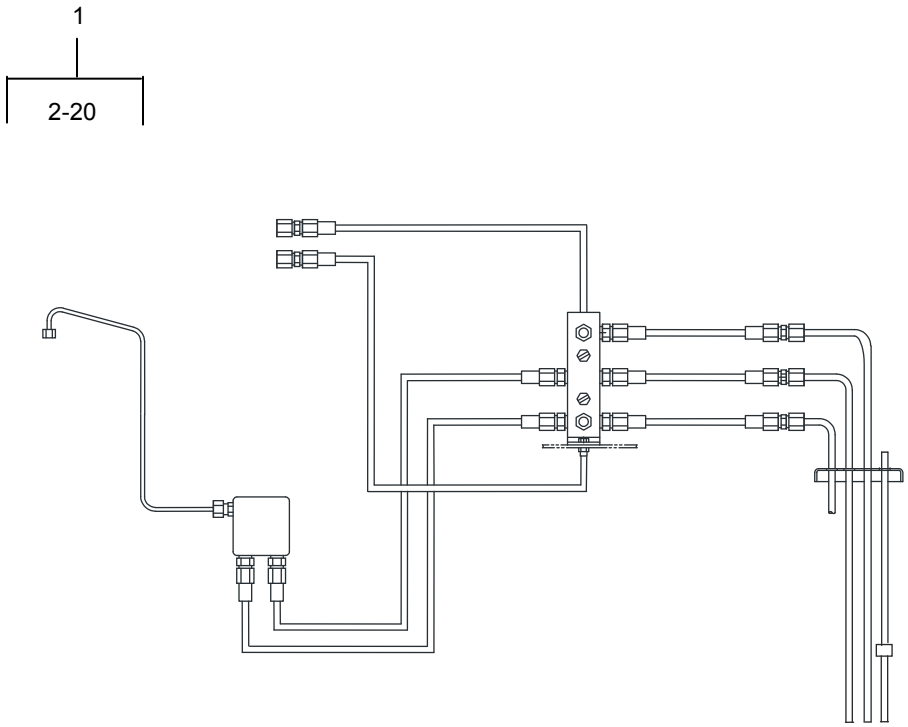


Figure 7. Fuel Piping Assembly. (Sheet 1 of 4).

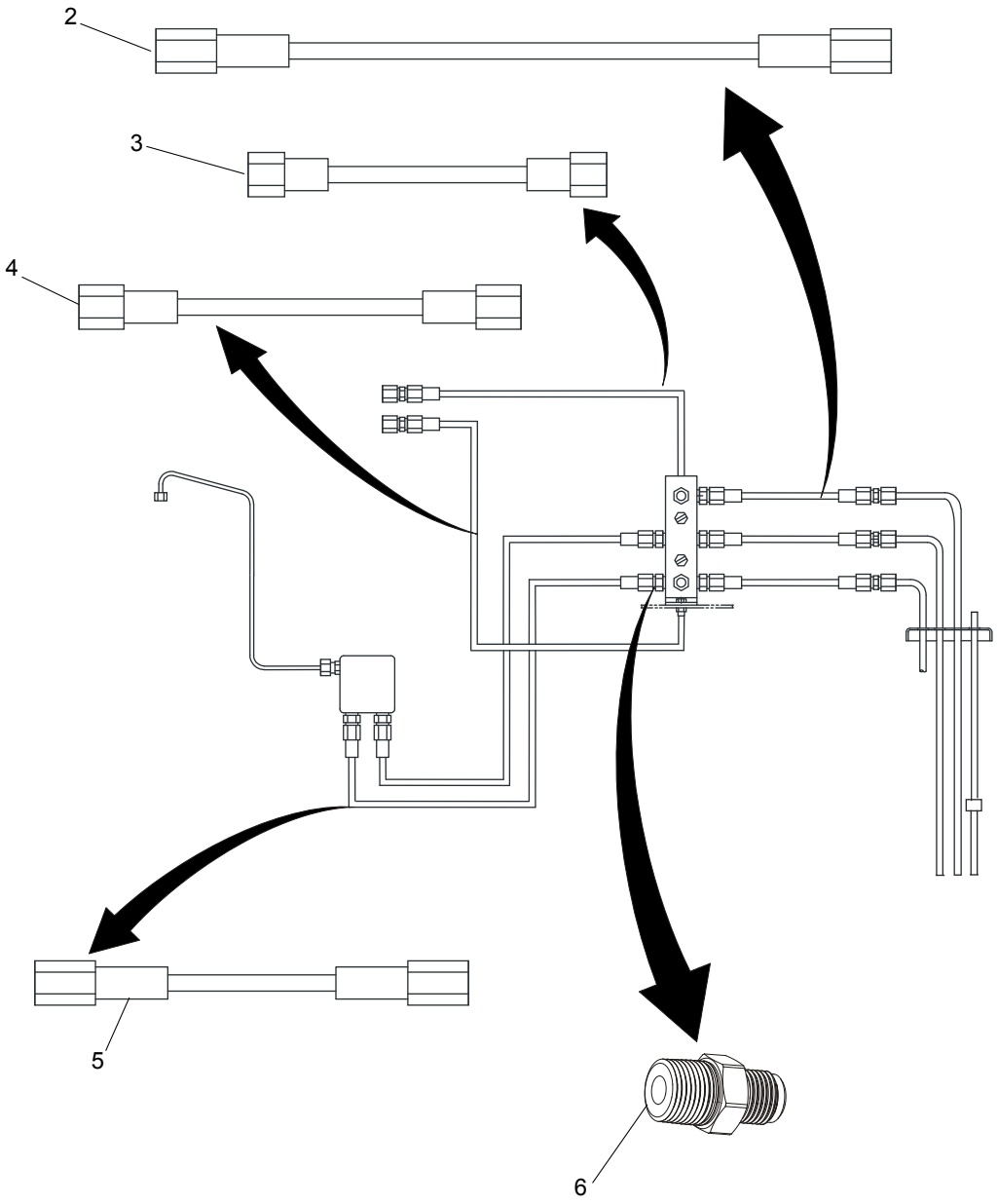


Figure 7. Fuel Piping Assembly. (Sheet 2 of 4).

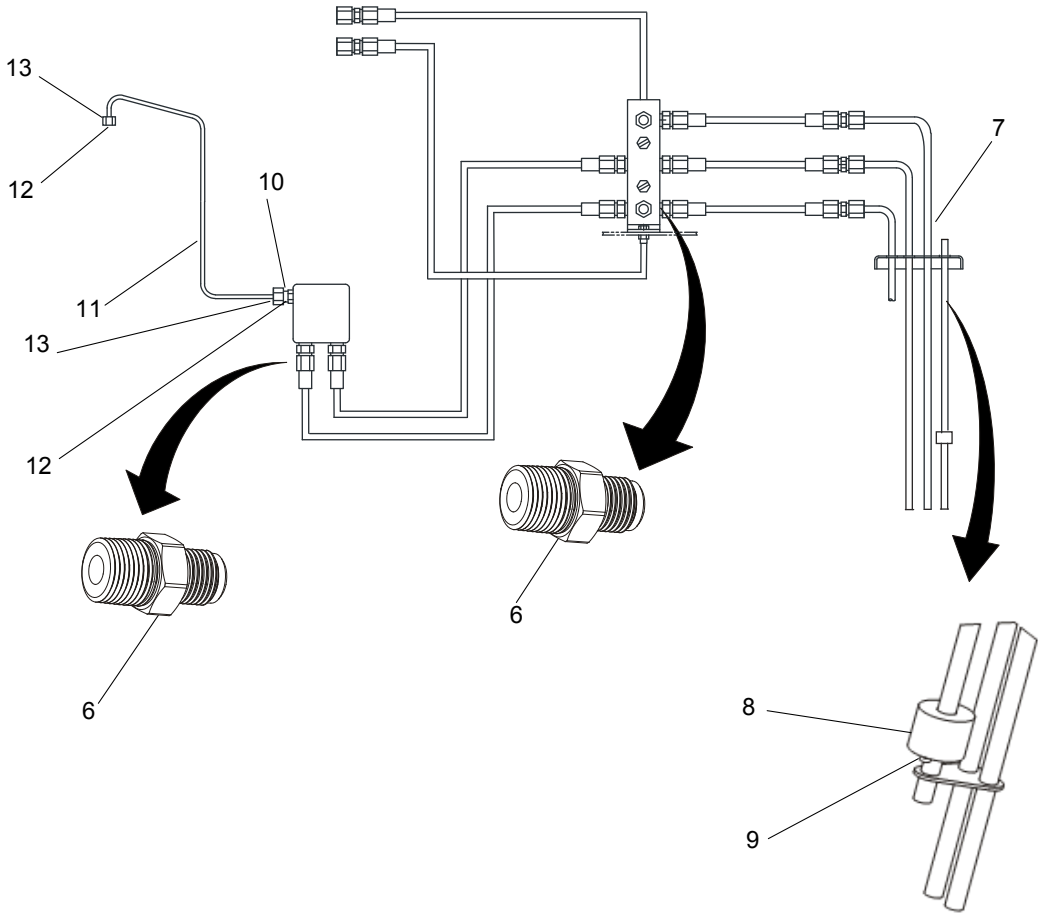


Figure 7. Fuel Piping Assembly. (Sheet 3 of 4).

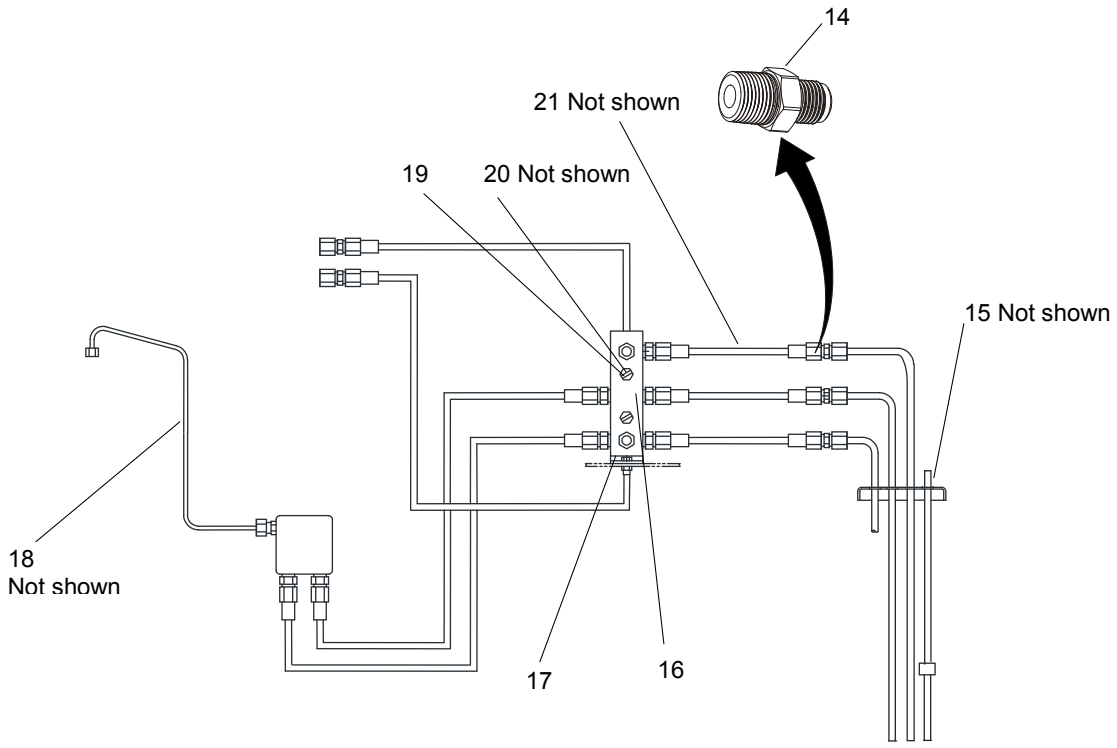


Figure 7. Fuel Piping Assembly. (Sheet 4 of 4).

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USUABLE ON CODE (UOC)	(7) QTY
					GROUP 0105	
					FIG. 7 FUEL PIPING ASSEMBLY	
1	XBFDD		D0356	2.641-237.0	PIPE FUEL ASSEMBLY	1
2	PAFZZ	4720-12-351-7522	D0356	6.389-036.0	.HOSE ASSEMBLY, NONMETALLIC	3
3	PAFZZ	4720-12-330-9290	D0356	6.388-984.0	.HOSE ASSEMBLY, NONMETALLIC	1
4	PAFZZ	4720-12-330-9291	D0356	6.388-901.0	.HOSE ASSEMBLY, NONMETALLIC	1
5	PAFZZ	4720-12-330-9293	D0356	6.388-902.0	.HOSE ASSEMBLY, NONMETALLIC	2
*6	PAFZZ	4730-12-331-2045	D0356	6.386-163.0	.ADAPTER, STRAIGHT	9
*7	PAFZZ	4730-12-374-6339	D0356	3.063-006.0	.MANIFOLD, FUELING	1
8	PAFZZ	5930-12-374-6647	D0356	6.631-376.0	.SWITCH, LIQUID LEVEL	1
*9	PAFZZ	5315-01-569-7268	39424	98338A110	.PIN, COTTER	1
10	PAFZZ	4730-12-130-7821	D0356	6.386-157.0	.ADAPTER, STRAIGHT, TUBE	1
*11	PAFZZ	4710-12-383-5227	D0356	5.423-337.0	.TUBE,BENT, METALLIC	1
12	PAFZZ	4730-12-169-1435	D0356	6.386-160.0	.SLEEVE, CLINCH, TUBE	2
13	PAFZZ	4730-12-132-5661	D0356	6.386-346.0	.NUT, TUBE, COUPLING	2
14	PAFZZ	4730-12-131-3728	D0356	7.386-121.0	.NIPPLE, TUBE	3
*15	PAFZZ	5305-12-374-6784	D0356	7.307-213.0	.SETSCREW	1
16	PAFZZ	5340-12-351-0372	D0356	5.018-273.0	.BRACKET, ANGLE	1
17	PAFZZ	4730-12-331-4224	D0356	5.696-002.0	.CONNECTOR, MULTIPLE	1
18	PAFZZ	5340-12-146-1815	D0356	6.373-310.0	.CLAMP, LOOP	1
*19	PAFZZ	5310-12-365-7038	19008	ISO10511-M6-A4-70	.NUT, SELF LOCKING HE	2
*20	PAFZZ	5305-12-376-6861	D0356	7.306-118.0	.SCREW, CAP SOCKET HE	2
21	PAFZZ	5340-12-159-5154	D0356	6.996-979.0	CLAMP, LOOP	4
					END OF FIGURE	

END OF WORK PACKAGE

FIELD MAINTENANCE
FLOW HEATER

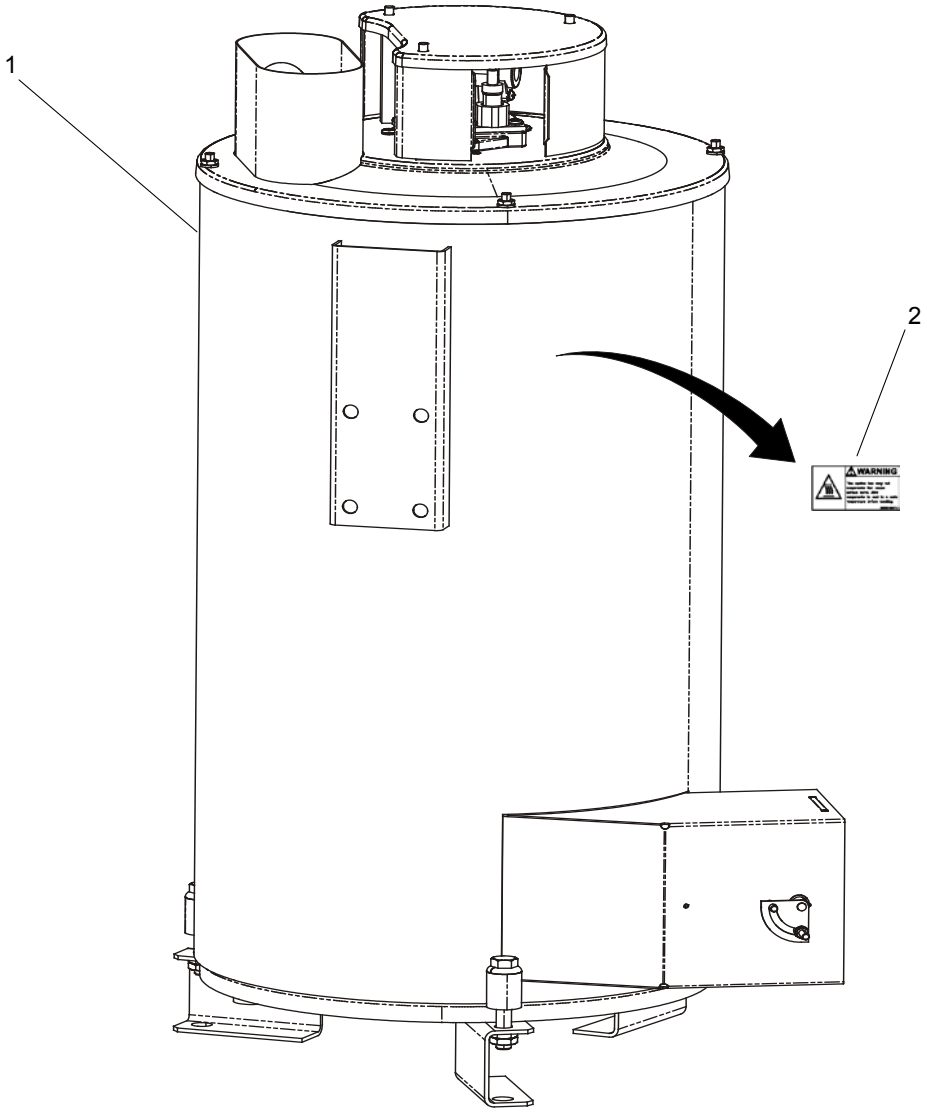


Figure 8. Flow Heater. (Sheet 1 of 6).

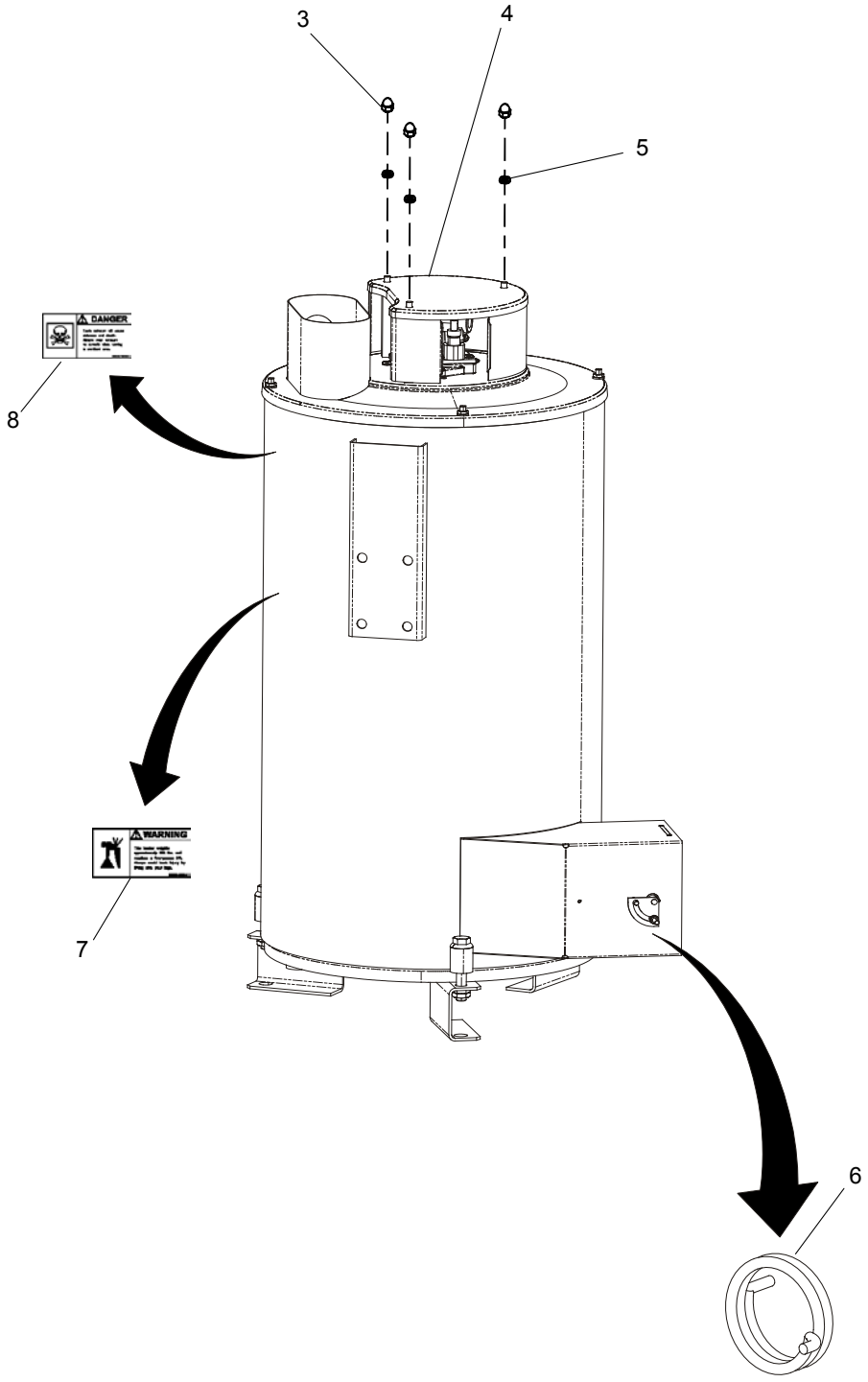


Figure 8. Flow Heater. (Sheet 2 of 6).

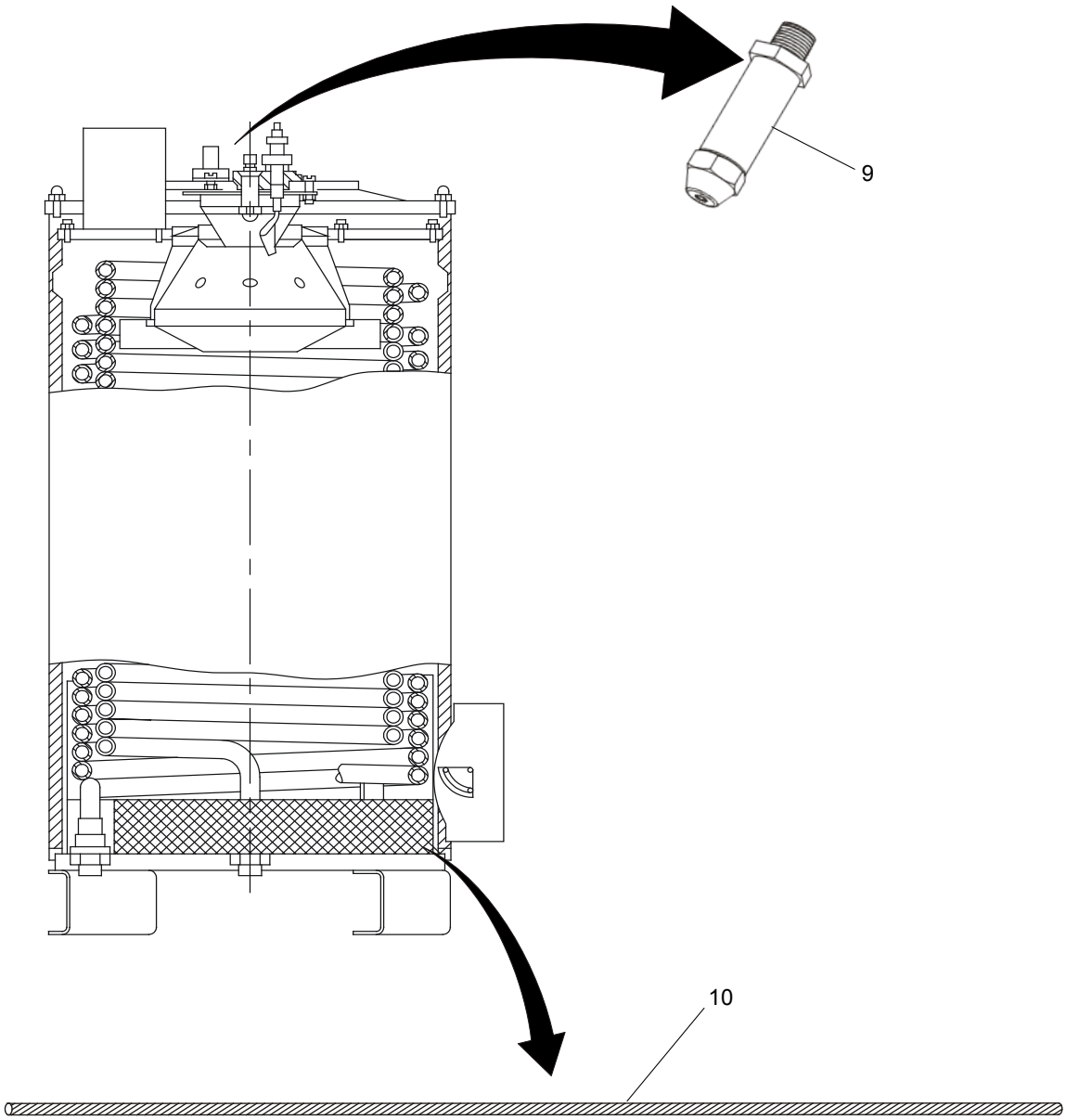


Figure 8. Flow Heater. (Sheet 3 of 6).

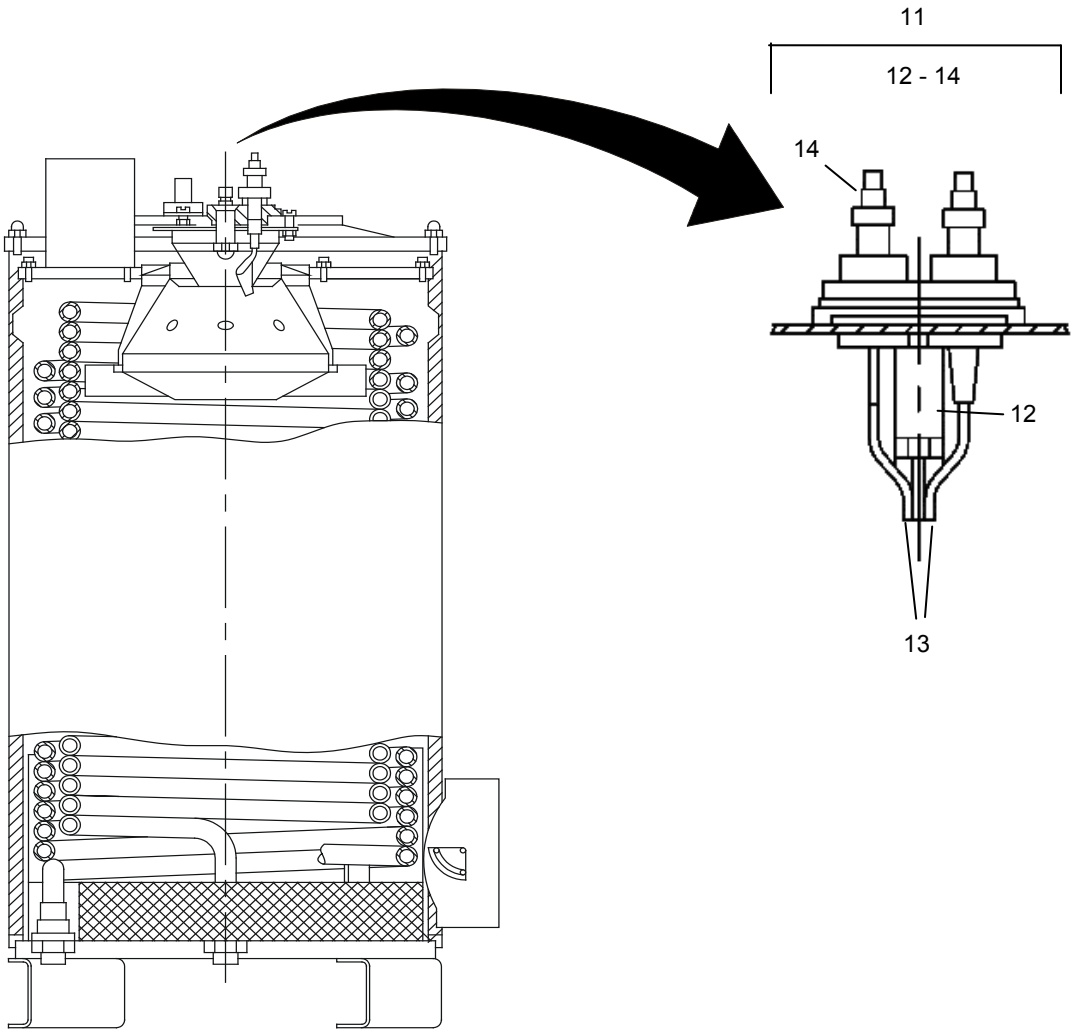


Figure 8. Flow Heater. (Sheet 4 of 6).

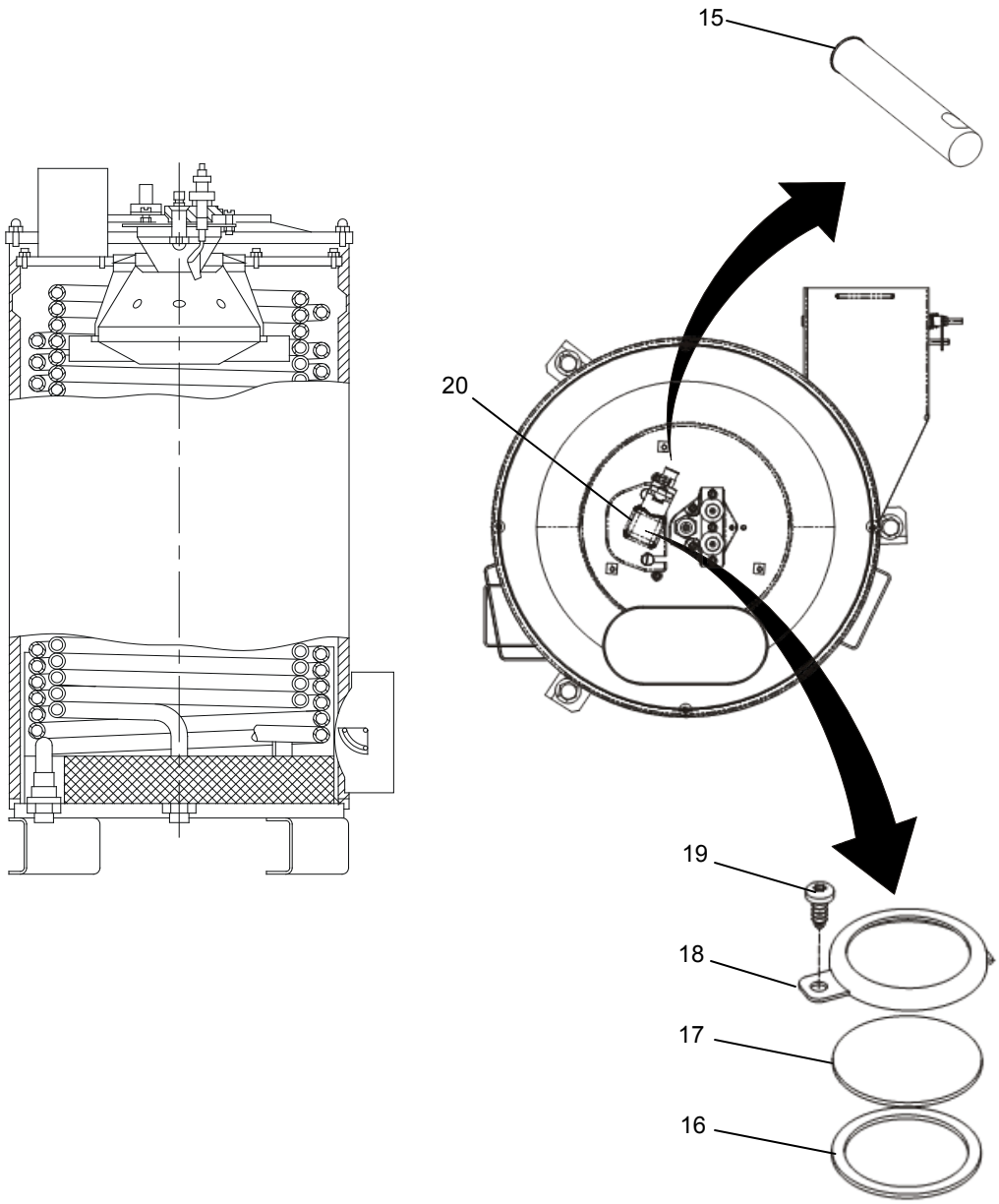


Figure 8 Flow Heater. (Sheet 5 of 6).

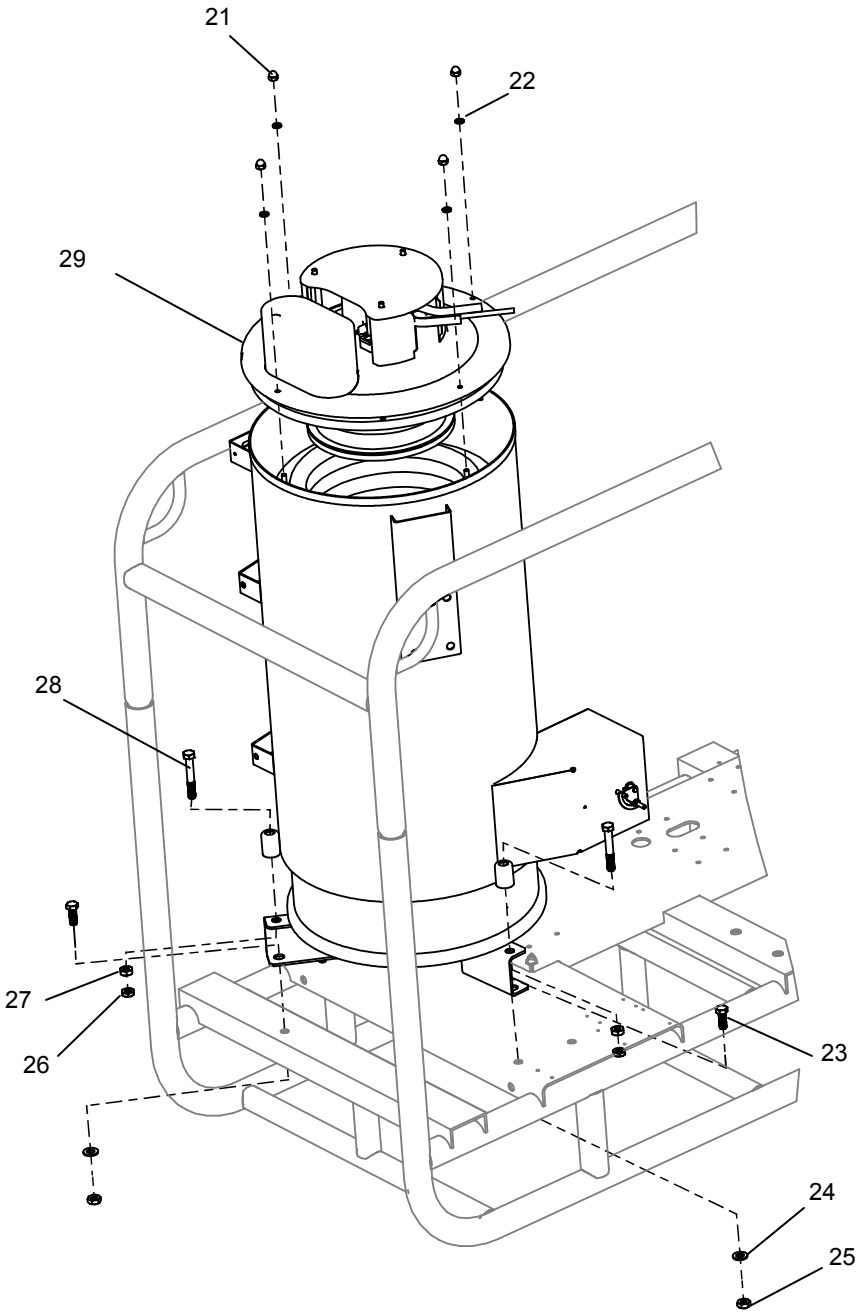


Figure 8 Flow Heater. (Sheet 6 of 6).

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USUABLE ON CODE (UOC)	(7) QTY
					GROUP 0106	
					FIG. 8 FLOW HEATER	
1	PAFDD	4410-12-375-2256	D0356	2.641-234.0	HEATER, WATER, LIQUID	1
*2	XBFZZ		98255	91147	.LABEL, HOT COMPONENTS	2
*3	PAFZZ	5310-12-148-8286	D0356	7.311-380.0	.NUT, PLAIN, CAP	7
4	PAFZZ	4940-12-351-6532	D0356	4.066-135.0	.COVER, STEAM CLEANER	1
*5	PAFZZ	5310-12-142-0659	D8286	DIN127-B6-FST-A3P	.WASHER, LOCK	7
6	PAFZZ	5360-12-148-8267	D0356	5.335-001.0	.SPRING, HELICAL TORSION	1
*7	XBFZZ		98255	91158	.LABEL, HEATER WEIGHT	1
*8	XBFZZ		98255	91146	.LABEL, TOXIC EXHAUST	1
*9	PAFZZ	ITEM DELETED	D0356	6.415-053.0	.NOZZLE, OIL BURNER	1
10	PAFZZ	5330-12-312-9251	D0356	6.366-006.0	.PACKING MATERIAL	1
11	PAFFF	5977-12-324-1650	D0356	4.826-031.0	.ELECTRODE	1
12	PAFZZ	4530-12-353-3369	D0356	6.415-053.0	..NOZZLE, OIL BURNER	1
13	PAFZZ	5977-12-307-4847	D0356	2.880-177.0	..ELECTRODE SET	1
*14	PAFZZ	5340-12-309-0198	D0356	5.127-010.0	..POST, ELECTRICAL-MEC	2
*15	XADZZ		D0356	6.664-024.0	.PHOTOMETER, FLAME	1
16	PAFZZ	5330-12-331-0174	D0356	5.364-100.0	.GASKET	1
17	PAFZZ	6680-12-322-2860	D0356	6.278-014.0	.GLASS, LIQUID SIGHT	1
18	PAFZZ	5340-12-306-8593	D0356	5.000-403.0	.COVER, ACCESS	1
*19	PAFZZ	5305-01-580-3992	39428	96817A310	.SCREW, TAPPING	1
20	PAFZZ	5980-12-353-4375	D0356	5.669-010.0	.HOLDER, PHOTOELECTRIC	1
*21	PAFZZ	ITEM DELETED	D0356	7.311-380.0	.NUT, PLAIN, CAP	4
*22	PAFZZ	ITEM DELETED	D0356	7.313-003.0	.WASHER, LOCK	4
*23	PAFZZ	5305-01-466-6467	39428	91280A630	.SCREW, CAP, HEXAGON	3
*24	PAFZZ	5310-12-142-0481	D8286	DIN125-B10,5-140HV-A3P	.WASHER, FLAT	3
*25	PAFZZ	5310-01-559-8870	39428	90576A118	.NUT, SELF LOCKING, HE	3
26	PAFZZ	5310-01-554-5594	39428	90591A171	.NUT, PLAIN, HEXAGON	3
*27	PAFZZ	5310-01-574-2139	39428	90695A041	.NUT, PLAIN, HEXAGON	3
*28	PAFZZ	5305-01-573-2441	39428	91280A649	.SCREW, CAP, HEXAGON	3
*29	PAOZZ	4530-12-330-9506	D0356	4.654-115.0	.HOUSING PART, BURNER	1
					END OF FIGURE	

END OF WORK PACKAGE

FIELD MAINTENANCE
DIESEL ENGINE

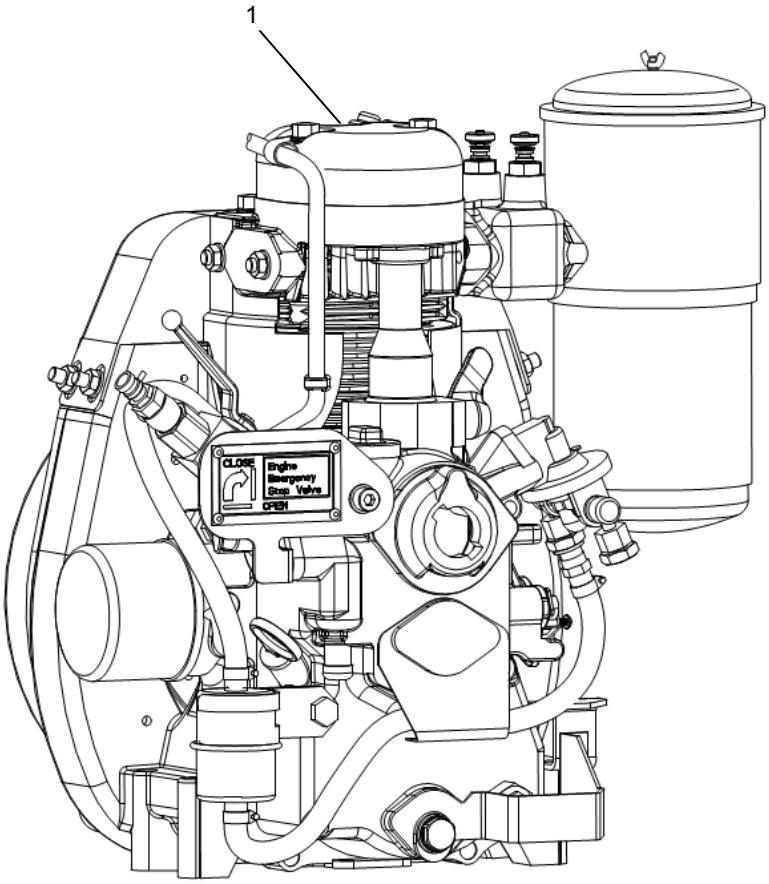


Figure 9. Diesel Engine. (Sheet 1 of 16).

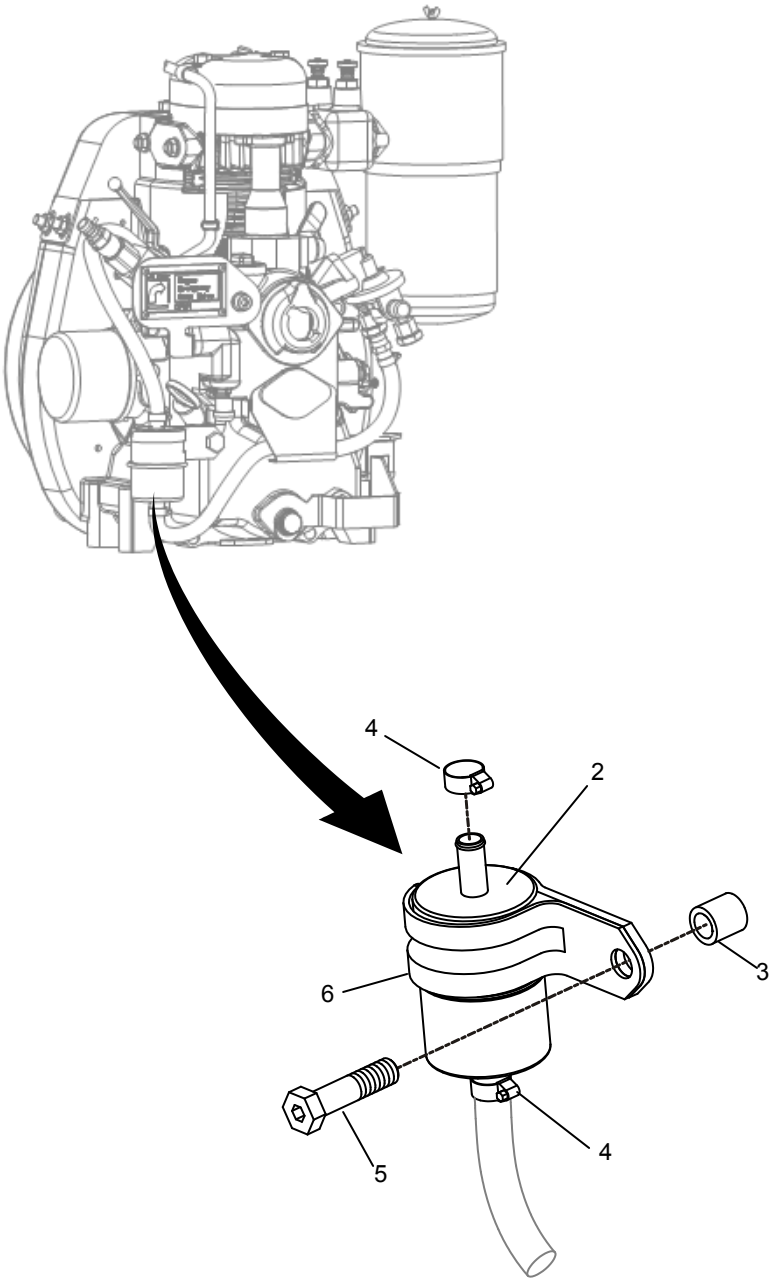


Figure 9. Diesel Engine (Sheet 2 of 16).

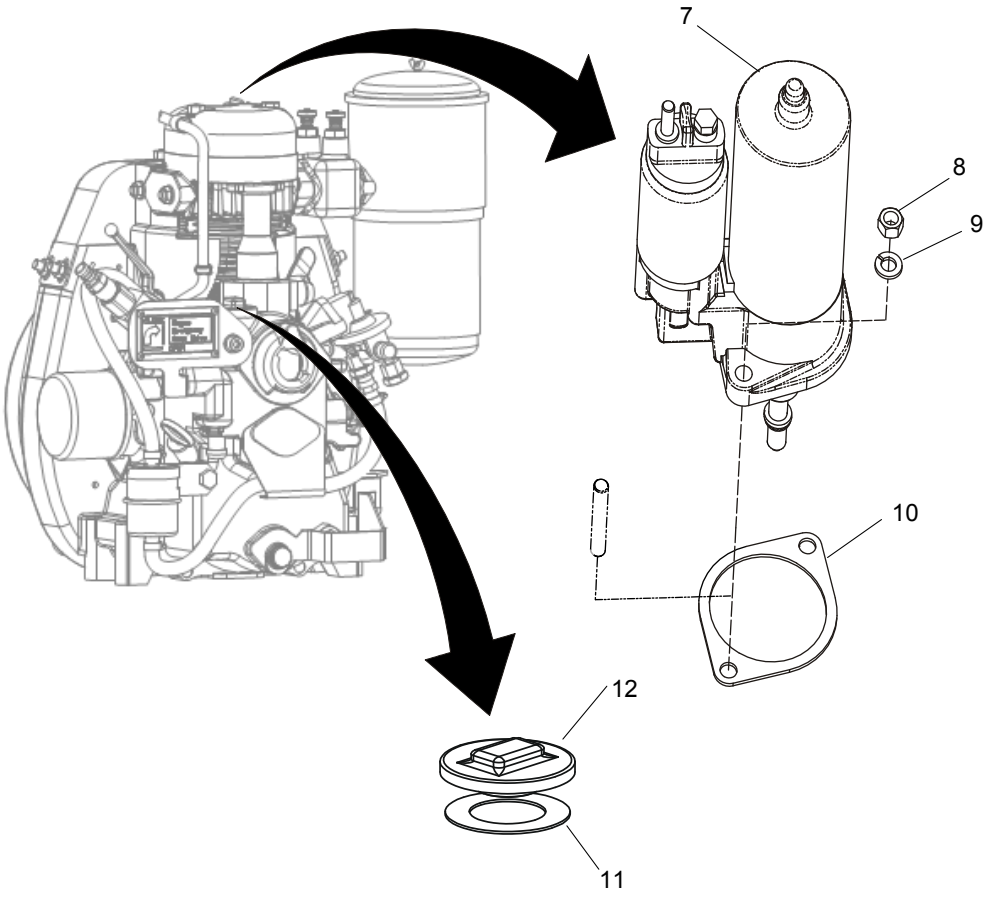


Figure 9. Diesel Engine. (Sheet 3 of 16).

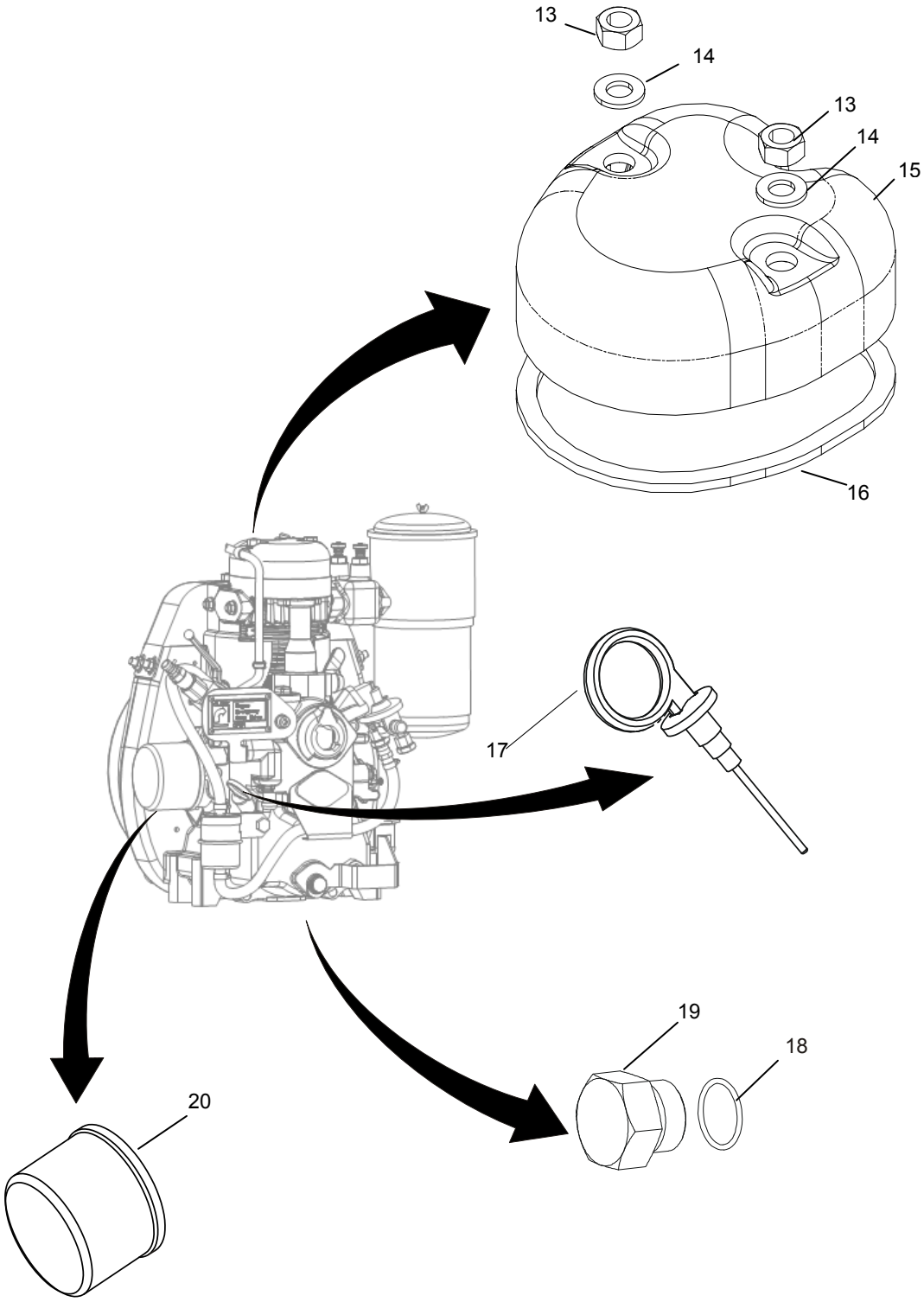
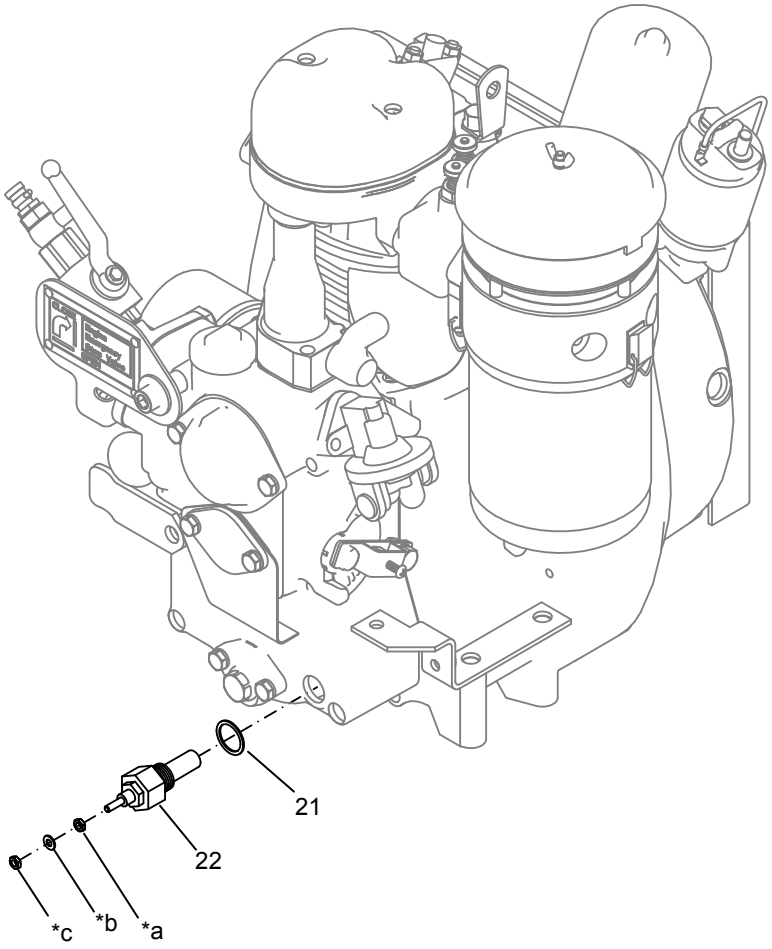


Figure 9. Diesel Engine. (Sheet 4 of 16).



***a PART OF ITEM 22**
***b PART OF ITEM 22**
***c PART OF ITEM 22**

Figure 9. Diesel Engine. (Sheet 5 of 16).

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USUABLE ON CODE (UOC)	(7) QTY
					GROUP 0107	
					FIG. 9 DIESEL ENGINE	
*1	PAFDD	2815-12-376-3027	5VT73	18B 437 0117 M5	ENGINE,DIESEL	1
*2	PAFZZ	2910-12-314-8154	5VT73	541.038.2	.FILTER, FLUID	1
*3	PAFZZ	5365-12-196-7017	5VT73	466.008.4	.SPACER, SLEEVE	1
*4	PAFZZ	4730-12-163-3346	5VT73	922.072.2	.CLAMP, HOSE	2
*5	PAFZZ	5305-12-351-8765	5VT73	890.31.35	.SCREW, CAP, SOCKET, HE	1
*6	PAFZZ	5340-12-374-7755	5VT73	923.934.4	.BRACKET, MOUNTING	1
*7	PAFZZ	2920-12-375-1690	5VT73	547.465.1	.STARTER, ENGINE, ELECTRIC	1
*8	PAFZZ	5310-12-374-7633	5VT73	514.061.2	.NUT,PLAIN, HEXAGON	2
*9	PAFZZ	5310-12-351-8861	5VT73	890.11.05	.WASHER, SPRING TENSION	2
*10	PAFZZ	2920-12-379-0659	5VT73	945.039.4	.ADAPTER, ELECTRICAL	1
*11	PCFZZ	5330-12-318-6412	5VT73	850.066.4	.GASKET	1
*12	PAFZZ	5365-12-342-1219	5VT73	G509.018.4	.PLUG, MACHINE THREAD	1
*13	PAFZZ	5310-12-196-3160	5VT73	514.037.4	.NUT, PLAIN, EXTENDED	2
*14	PAFZZ	5310-12-151-4065	D8286	DIN125-A8, 4-PA	.WASHER, FLAT	2
*15	PAFZZ	4820-12-197-6729	5VT73	651.032.4	.HEAD, VALVE	1
*16	PAFZZ	5330-12-318-4892	5VT73	770.142.4	.GASKET	1
*17	PAFZZ	6680-12-196-3154	5VT73	762.106.5	.GAGE, ROD, LIQUID LEVEL	1
*18	PAFZZ	5330-12-130-9885	D8286	DIN7603-A17X23-CU	.GASKET	1
*19	PAFZZ	4730-12-331-1110	5VT73	890.30.03	.PLUG, PIPE	1
*20	PAFZZ	2940-12-342-1512	5VT73	541.050.2	.FILTER, ELEMENT, FLUID	1
*21	PCFZZ	5330-12-156-4521	5VT73	890.74.16	.GASKET	4
*22	PADZZ	4520-12-326-2686	5VT73	555.127.2	.HEATING ELEMENT, ELE	1
*TBD	PAFZZ	5340-12-351-8772	5VT73	922.077.2	.CLAMP, LOOP	1
*TBD	PAFZZ	5330-12-341-3154	D8889	850.067.4	.GASKET	1
*TBD	PCFZZ	5330-12-351-8761	D8889	770.273.5	..GASKET	1
						1

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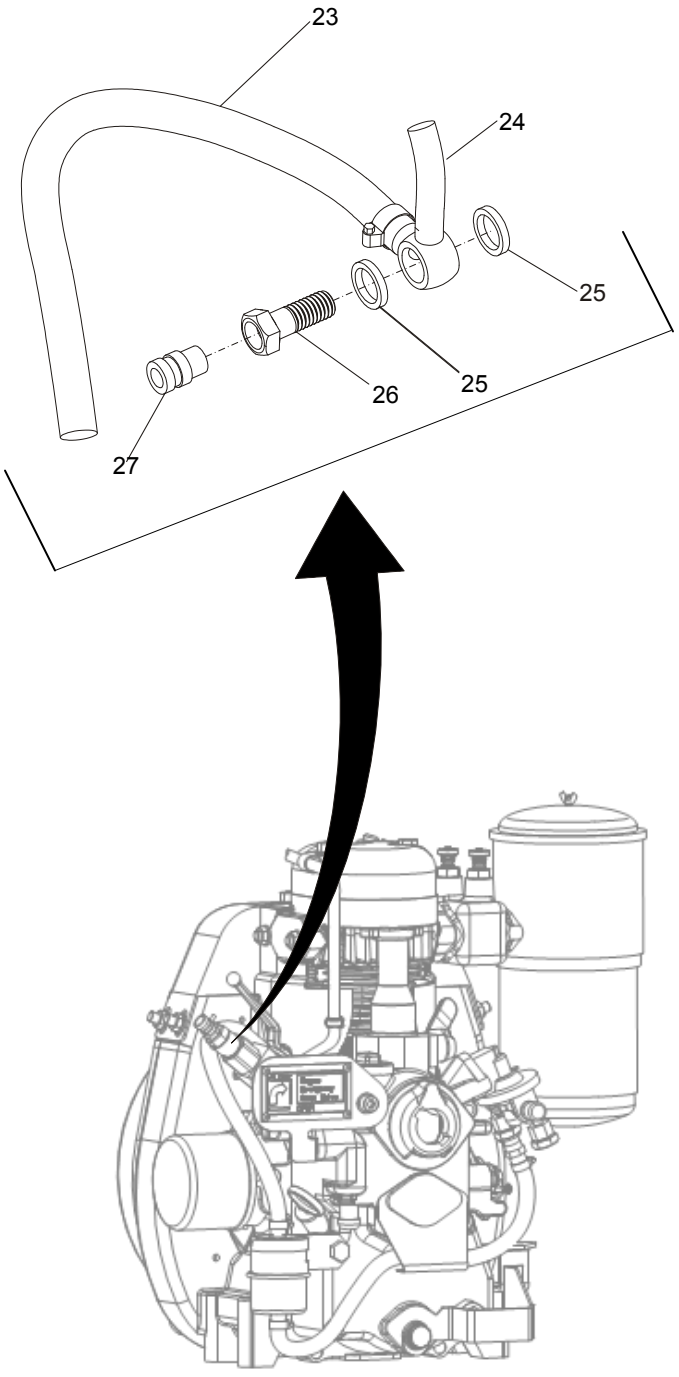


Figure 9. Diesel Engine. (Sheet 6 of 16).

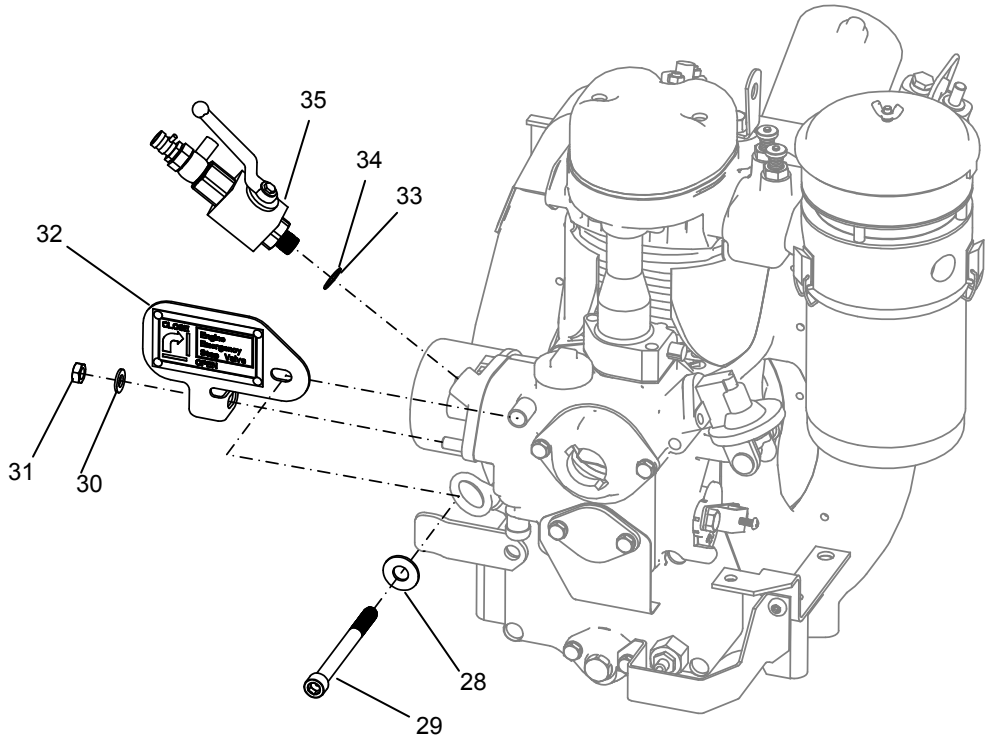


Figure 9. Diesel Engine. (Sheet 7 of 16).

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USUABLE ON CODE (UOC)	(7) QTY
					GROUP 0107	
					FIG. 9 DIESEL ENGINE	
*23	PAFZZ	4710-12-374-7751	5VT73	E971.254.5	.TUBE ASSEMBLY, METAL	1
*24	PAFZZ	4710-12-379-1592	5VT73	971.367.5	.TUBE ASSEMBLY, METAL	1
25	PAFZZ	5330-12-156-4521	5VT73	890.74.16	.GASKET	2
*26	PAFZZ	4730-12-379-5945	5VT73	515.426.4	.BOLT, FLUID PASSAGE	1
*27	PAFZZ	4820-12-374-7747	5VT73	555.173.1	. VALVE, PRESSURE EQUIP	1
*28	PAFZZ	5310-12-179-2417	5VT73	890.92.01	.WASHER, FLAT	1
*29	PAFZZ	5307-12-374-7770	5VT73	890.28.17	.STUD, PLAIN	1
*30	PAFZZ	5310-12-350-7085	5VT73	890.10.05	.WASHER, LOCK	1
*31	PAFZZ	5310-12-350-7078	5VT73	890.38.05	.NUT, PLAIN, HEXAGON	1
*32	PAFZZ	5340-12-374-9559	5VT73	995.159.6	.PLATE, MOUNTING	1
33	PAFZZ	5330-12-156-4521	D8889	890.74.16	.GASKET	1
*34	PAFZZ	5330-12-324-6761	5VT73	890.74.17	.GASKET	1
*35	PAFZZ	4820-12-374-8013	5VT73	555.203.2	.VALVE, BALL	1

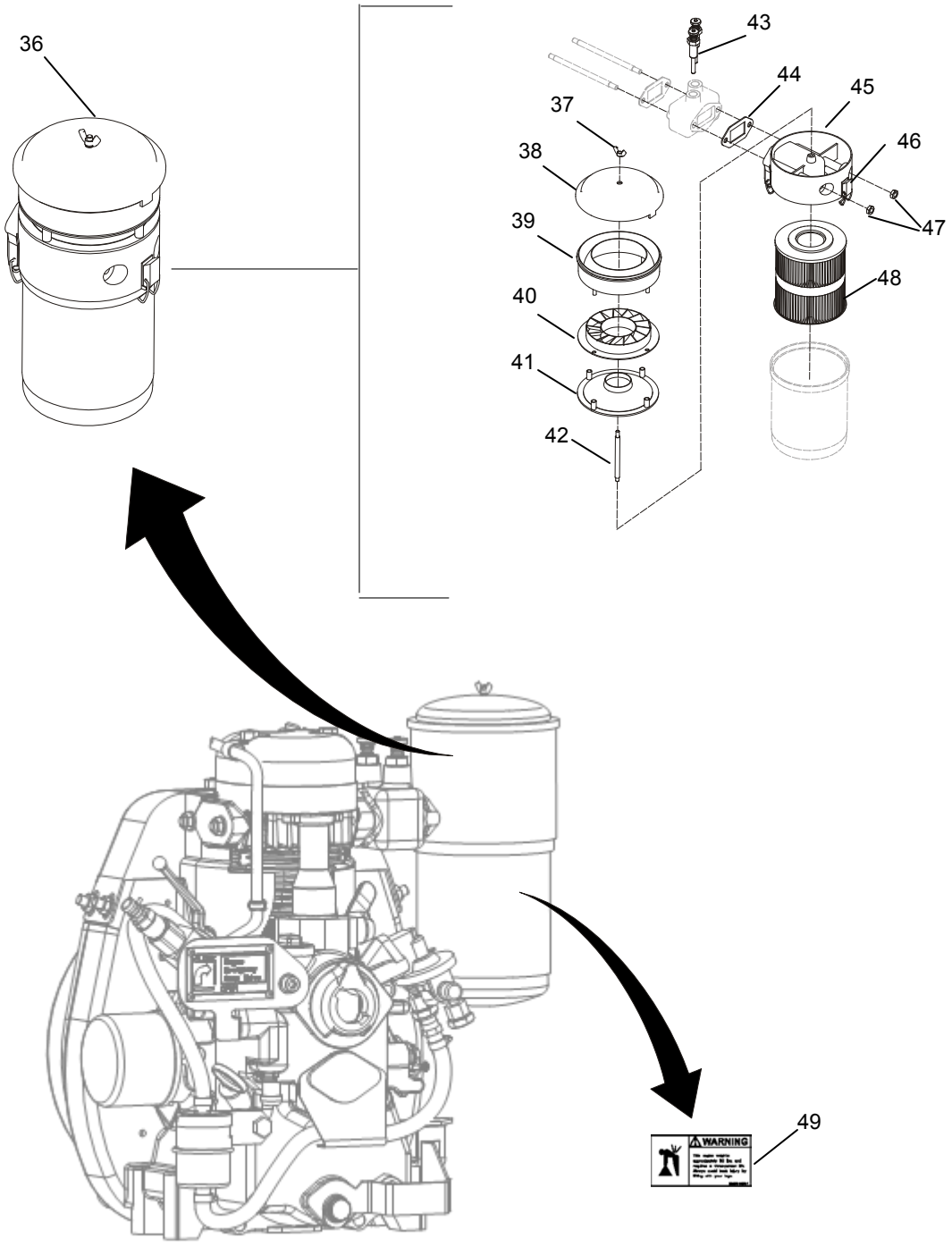


Figure 9. Diesel Engine. (Sheet 8 of 16).

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USUABLE ON CODE (UOC)	(7) QTY
					GROUP 0107	
					FIG. 9 DIESEL ENGINE	
*36	PAFFF	2940-12-331-3742	5VT73	741.144.5	.AIR CLEANER, INTAKE	1
*37	PAFZZ	5310-12-159-4923	5VT73	514.093.2	..NUT, SELF-LOCKING	1
*38	PAFZZ	5340-12-357-6359	5VT73	541.059.2	..COVER, ACCESS	1
*39	PAFZZ	2940-12-331-3434	5VT73	541.058.2	..BOWL, SEDIMENT	1
*40	PAFZZ	2940-12-331-3435	5VT73	541.057.2	..DEFLECTOR, AIR CLEANER	1
*41	PAFZZ	2940-12-331-3436	5VT73	541.056.2	..INTERMEDIATE BOTTOM	1
*42	PAFZZ	5307-12-357-6016	5VT73	512.158.2	..STUD, PLAIN	1
*43	PAFZZ	2920-12-318-3329	5VT73	555.122.2	..GLOW PLUG	2
*44	PAFZZ	5330-12-331-1616	5VT73	770.158.4	..GASKET	1
*45	PAFZZ	2940-12-357-6358	5VT73	624.099.4	..FILTER BODY, INTAKE	1
*46	PAFZZ	5340-12-185-4872	5VT73	555.129.1	..CATCH, CLAMPING	2
*47	PAFZZ	5310-12-374-7725	5VT73	890.47.51	..NUT, SELF-LOCKING, HE	2
*48	PAFZZ	2940-12-321-6174	5VT73	541.052.2	..FILTER ELEMENT, INTAKE	1
*49	XBFZZ		98255	91156	..LABEL,ENGINE WEIGHT	1

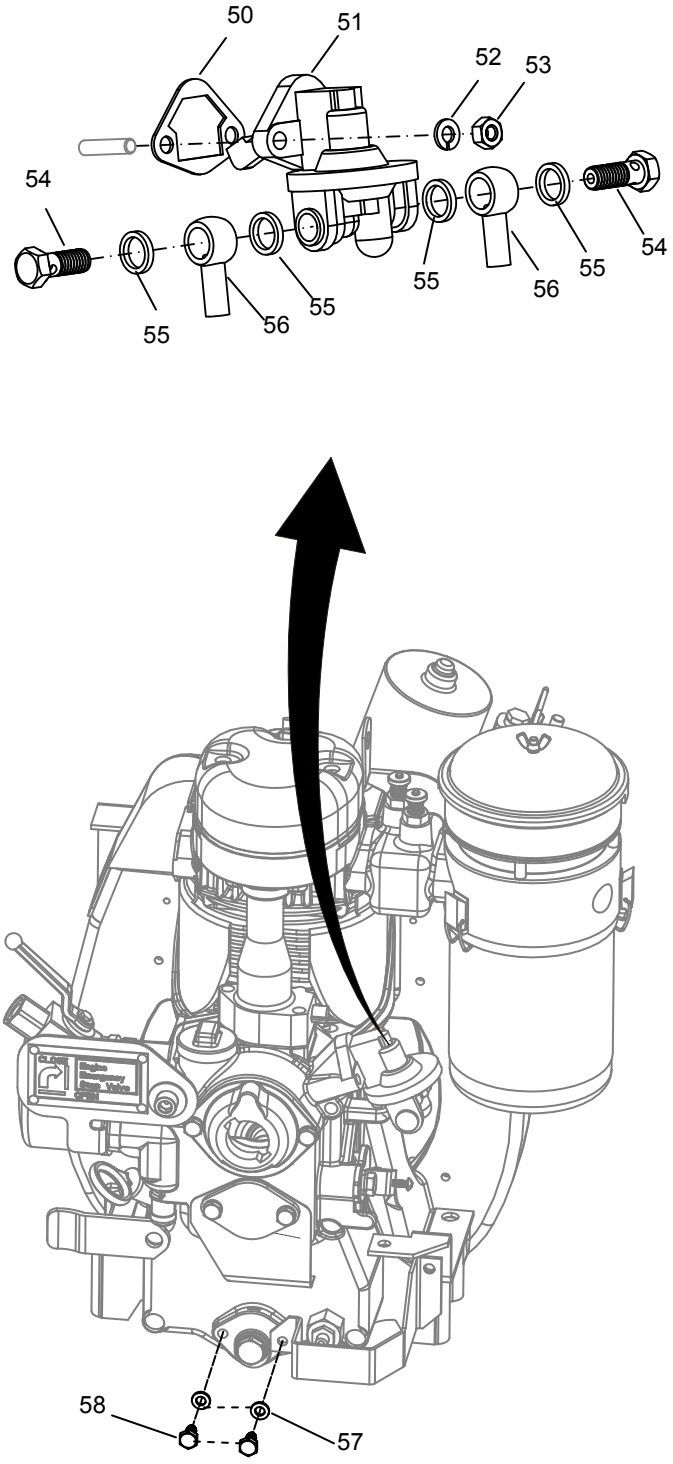


Figure 9. Diesel Engine. (Sheet 9 of 16).

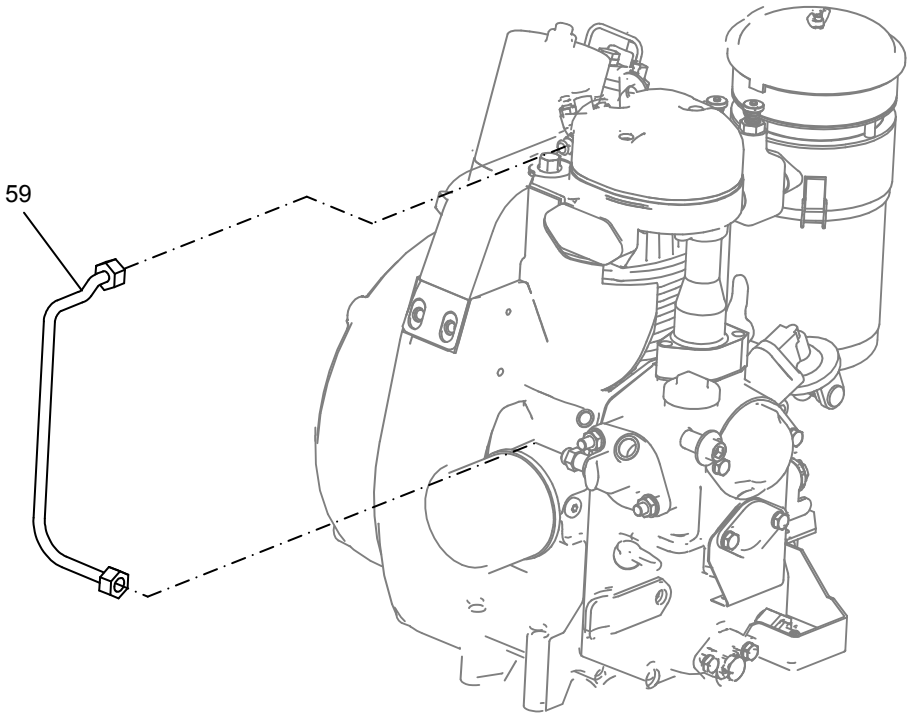


Figure 9. Diesel Engine. (Sheet 10 of 16).

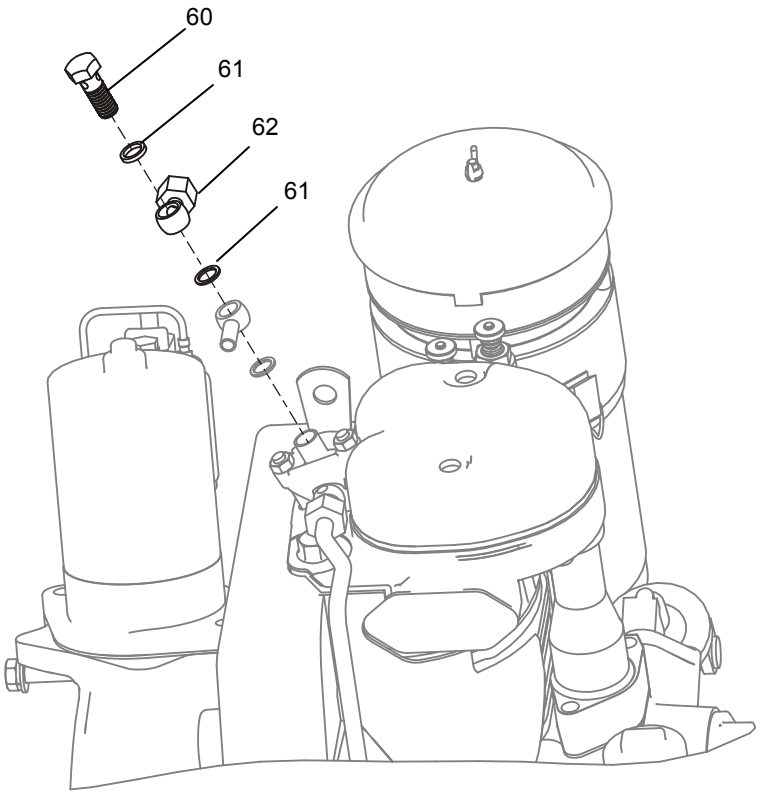


Figure 9. Diesel Engine. (Sheet 11of 16).

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USUABLE ON CODE (UOC)	(7) QTY
					GROUP 0107	
					FIG. 9 DIESEL ENGINE	
*50	PAFZZ	5330-12-318-4895	5VT73	847.123.4	.GASKET	1
*51	PAFZZ	2910-12-331-0909	5VT73	175.078.1	..PUMP, FUEL, CAM	1
*52	PAFZZ	5310-12-350-7077	5VT73	890.11.03	.WASHER, SPRING TENSION	2
*53	PAFZZ	5310-12-350-7079	5VT73	890.38.03	.NUT, PLAIN, HEXAGON	2
*54	PAFZZ	4730-12-124-1297	5VT73	515.357.2	.BOLT, FLUID PASSAGE	2
*55	PAFZZ	5330-12-150-9938	5VT73	890.74.06	.GASKET	6
*56	PAFZZ	4710-12-374-7751	5VT73	E971.254.5	.TUBE, ASSEMBLY, METAL	1
*57	PAFZZ	5330-12-350-7011	5VT73	890.74.04	.GASKET	2
*58	PAFZZ	5305-01-446-7915	39428	91280A322	.SCREW, CAP, HEXAGON	2
*59	PAFZZ	4710-12-196-2453	5VT73	971.321.5	.TUBE ASSEMBLY, METAL	1
*60	PAFZZ	4730-12-353-7960	5VT73	515.356.2	.BOLT, FLUID PASSAGE	1
*61	PAFZZ	5330-12-150-9938	5VT73	890.74.06	.GASKET	2
*62	PAFZZ	4730-12-379-0654	5VT73	515.086.6	.ADAPTER, STRAIGHT, TUBE	2
*TBD	PAFZZ	5330-01-602-5763	5VT73	770.168.4	.GASKET	1
*TBD	PAFZZ	4730-01-602-5815	5VT73	928.054.4	.FLANGE	1

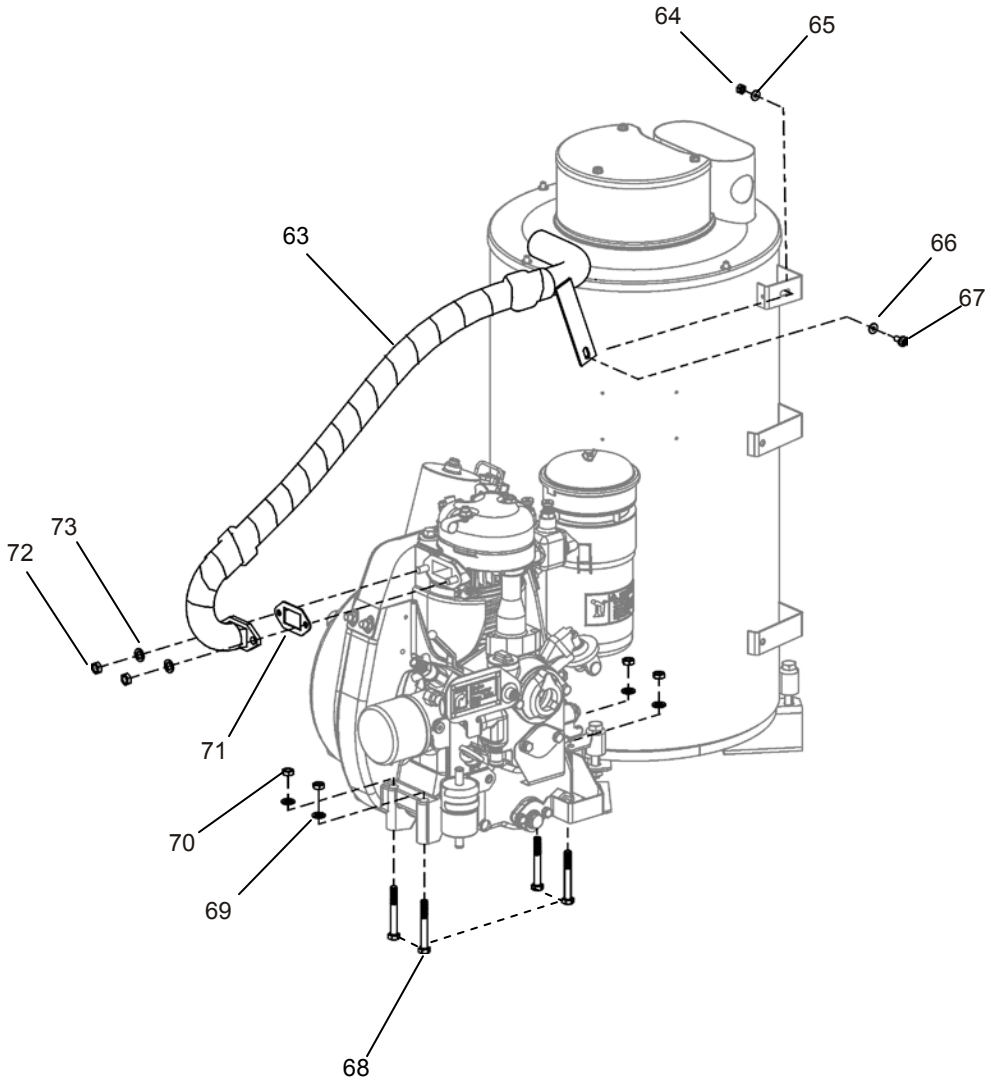


Figure 9. Diesel Engine. (Sheet 12 of 16).

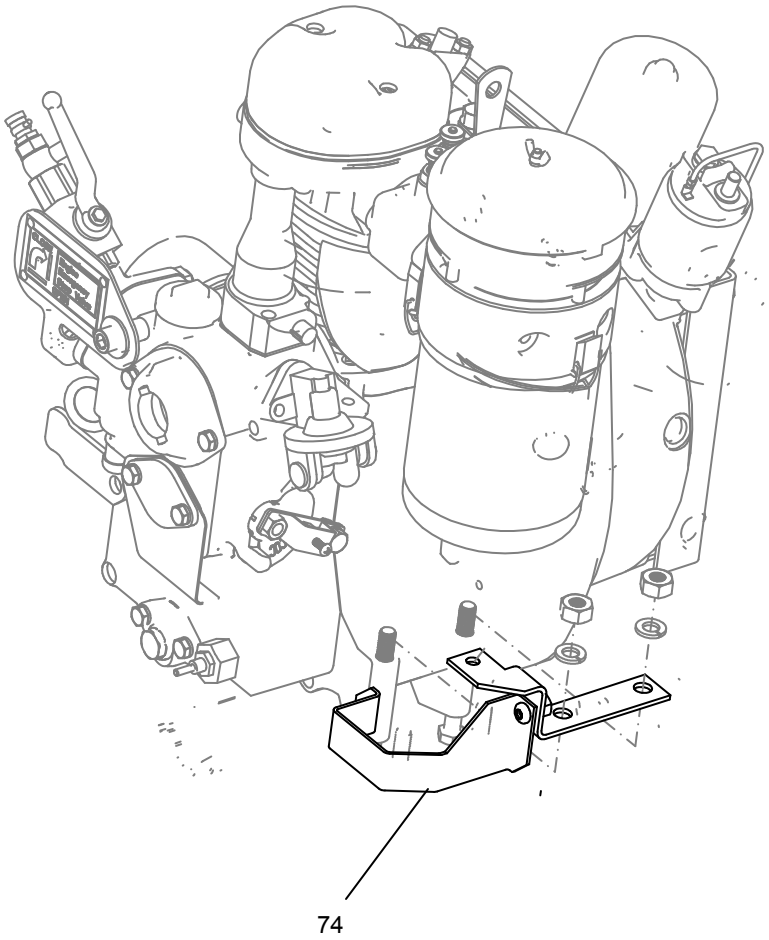


Figure 9. Diesel Engine. (Sheet 13 of 16).

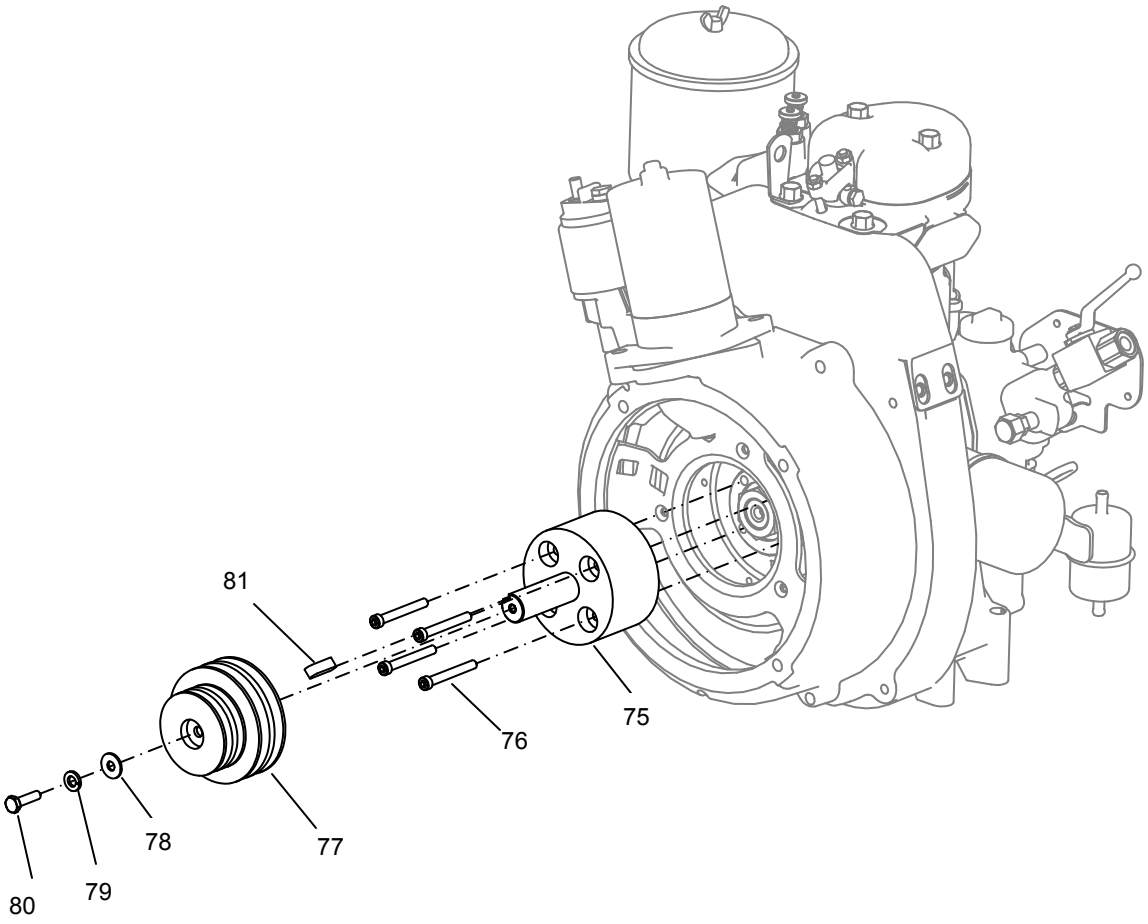


Figure 9. Diesel Engine. (Sheet 14 of 16).

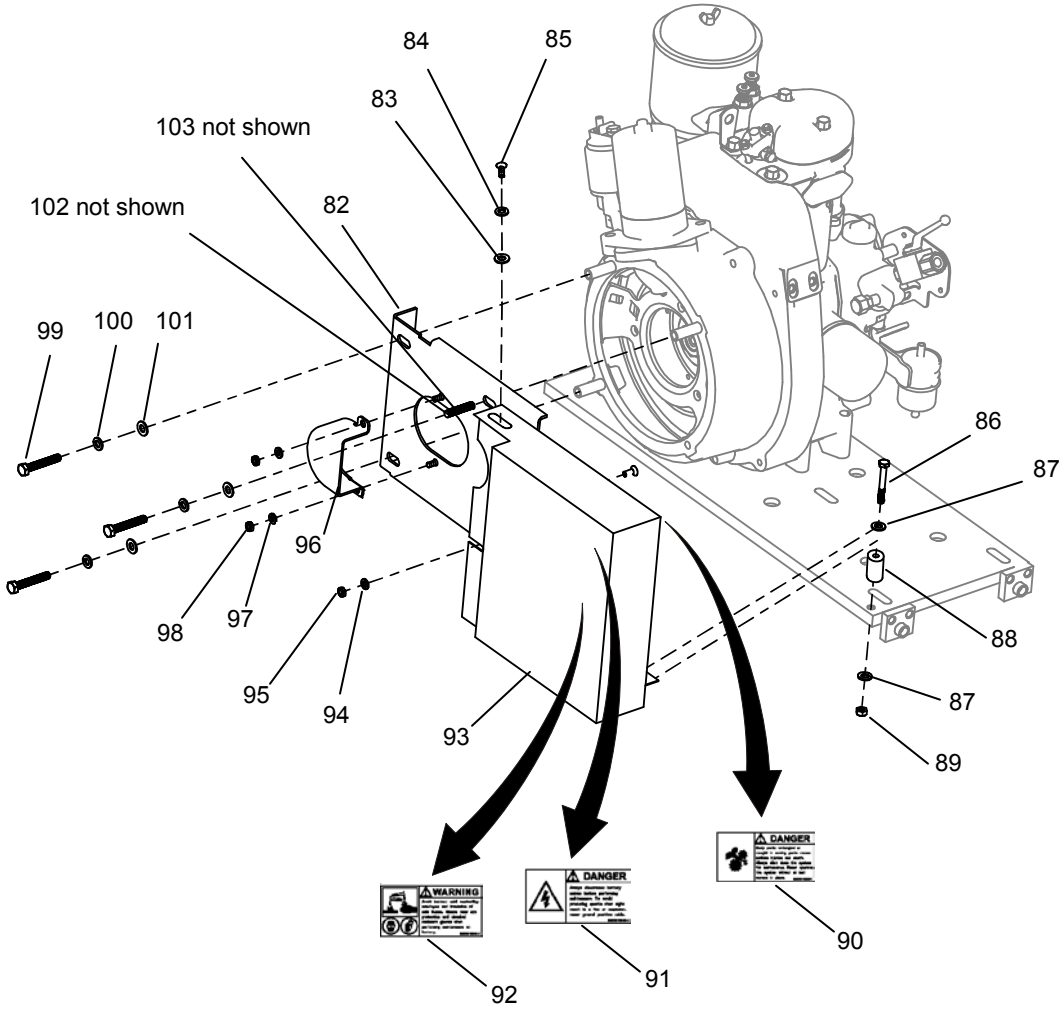


Figure 9. Diesel Engine. (Sheet 15 of 16).

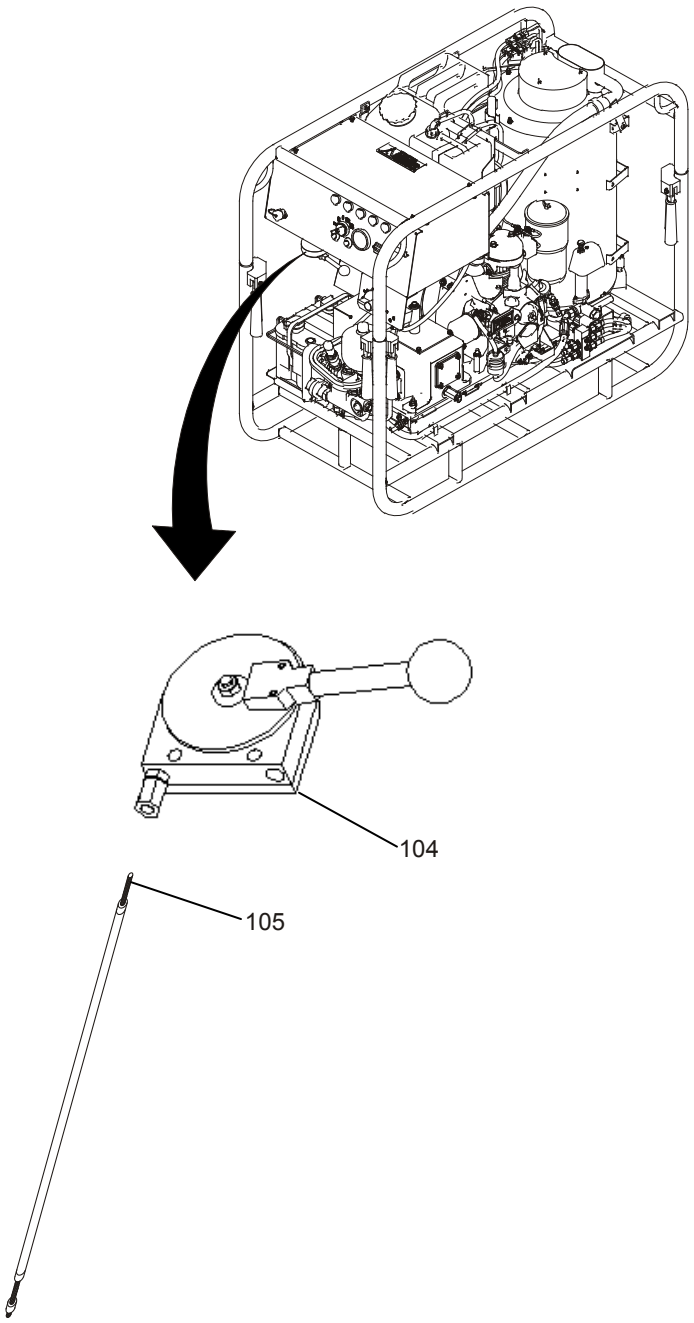


Figure 9. Diesel Engine. (Sheet 16 of 16).

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USUABLE ON CODE (UOC)	(7) QTY
					GROUP 0107	
					FIG. 9 DIESEL ENGINE	
*63	PAFZZ	4720-12-386-0179	D0356	4.006-045.0	PIPE, EXHAUST	1
*64	PAFZZ	5310-12-156-4991	S3465	4536226-786	NUT, PLAIN, HEXAGON	1
*65	PAFZZ	5310-12-142-0659	D8286	DIN127-B6-FST-A3P	WASHER, LOCK	1
*66	PAFZZ	5310-01-397-8096	39428	91166A250	WASHER, FLAT	1
*67	PAFZZ	5305-12-374-9143	D0356	7.306-090.0	SCREW, CAP, SOCKET	1
*68	PAFZZ	5305-01-534-7812	39428	91280A656	SCREW, CAP HEXAGON	4
*69	PAFZZ	5310-12-142-0481	D8286	DIN125-B10,5-140HV-A3P	WASHER, FLAT	4
*70	PAFZZ	5310-01-559-8870	39428	90576A118	NUT, SELF-LOCKING	4
71	PAFZZ	5330-12-331-1616	5VT73	770.158.4	GASKET	1
*72	PAFZZ	5310-01-517-9646	39428	91828A410	NUT, PLAIN HEXAGON	2
*73	PAFZZ	5310-12-142-0645	19206	12529588	WASHER, FLAT	2
*74	PAFZZ	5340-12-381-6938	D0356	5.034-276.0	BRACKET, DOUBLE ANGLE	1
75	PAFZZ	3040-12-351-0942	D0356	5.106-024.0	EXTENSION SHAFT	1
*76	PAFZZ	5305-12-142-2958	D8286	DIN912-M8X70-8.8-A2P	SCREW, CAP, SOCKET	4
77	PAFZZ	3020-12-350-8874	D0356	5.625-206.0	PULLEY, GROOVE	1
78	PAFZZ	5310-12-148-0603	D0356	7.312-261.0	WASHER, FLAT	1
*79	PAFZZ	5310-12-142-0658	D8286	DIN127-B8-FST-A3P	WASHER, LOCK	1
*80	PAFZZ	5305-12-141-9850	D8286	DIN933-M6x40-8.8-A2P	SCREW, CAP, HEXAGON	1
81	PAFZZ	5315-12-124-4346	D0356	7.318-042.0	KEY, MACHINE	1
82	PAFZZ	5340-12-350-9198	D0356	4.038-170.0	BRACKET, MOUNTING	1
*83	PAFZZ	5310-01-581-0458	39428	91100A150	WASHER, FLAT	1
*84	PAFZZ	5310-12-142-0659	D8286	DIN127-B6-FST-A3P	WASHER, LOCK	1
*85	PAFZZ	5305-12-374-9143	D0356	7.306-090.0	SCREW, CAP, SOCKET	1
*86	PAFZZ	5305-01-581-7726	39428	93635A235	SCREW, CAP, HEXAGON	1
87	PAFZZ	5310-01-526-3331	39428	90965A170	WASHER, FLAT	2
*88	XBFZZ		39428	92320A667	SPACER	1
89	PAFZZ	5310-01-553-5299	39428	94205A250	NUT, SELF LOCKING	1
*90	XBFZZ		98255	91149	LABEL, MOVING PARTS	1
*91	XBFZZ		98255	91148	LABEL, DISCONNECT BATTERY	1

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USUABLE ON CODE (UOC)	(7) QTY
*92	XBFZZ		98255	91152	LABEL, BATTERY ACID	1
*93	PAFZZ	4940-12-378-9169	D0356	5.009-113.0	HOUSING, STEAM	1
94	PAFZZ	ITEM DELETED	D0356	7.313-003.0	WASHER, LOCK	1
95	PAFZZ	5310-12-156-4991	S3465	4536226-768	NUT, PLAIN, HEXAGON	1
*96	PAFZZ	5340-12-381-0383	D0356	5.009-138.0	COVER PROTECTIVE	1
*97	PAFZZ	5310-01-397-8096	39428	91166A250	WASHER, FLAT	2
*98	PAFZZ	5310-01-414-7135	39428	90576A115	NUT, SELF LOCKING	2
*99	PAFZZ	5305-01-581-0393	39428	91280A648	SCREW, CAP HEXAGON	3
100	PAFZZ	5310-01-533-3780	39428	91202A242	WASHER, LOCK	3
*101	PAFZZ	5310-12-142-0481	D8286	DIN125-B10,5-140HV-A3P	WASHER, FLAT	3
102	PAFZZ	5310-12-374-9110	D0356	7.311-427.0	NUT, SELF LOCKING, HE	3
*103	PAFZZ	5310-12-142-0645	19206	12529588	WASHER, FLAT	3
*104	PAFZZ	3040-12-371-3949	D0356	6.373-382.0	LEVER, MANUAL CONTROL	1
105	PAFZZ	3040-12-324-8076	D0356	6.431-032.0	SHAFT, DRIVE FLEXIBLE	1

END OF FIGURE

END OF WORK PACKAGE

FIELD MAINTENANCE
FRAME ASSEMBLY

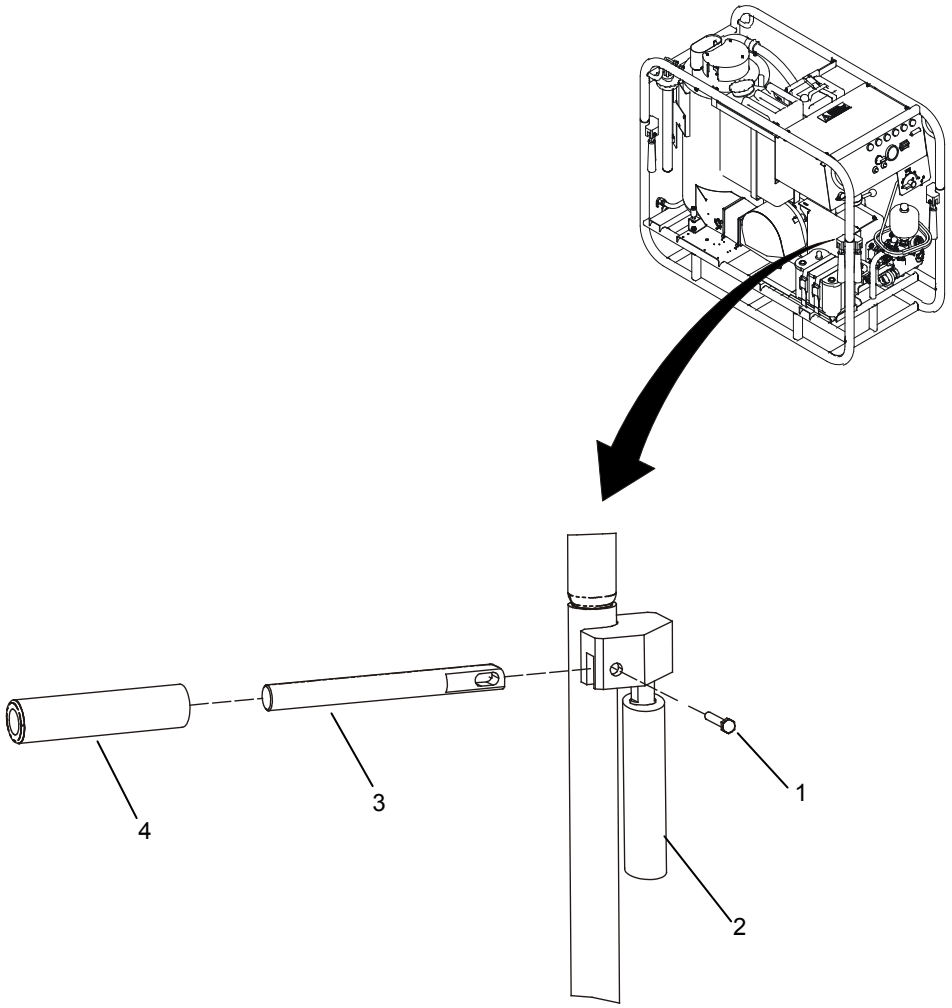


Figure 10. Frame Assembly. (Sheet 1 of 3).

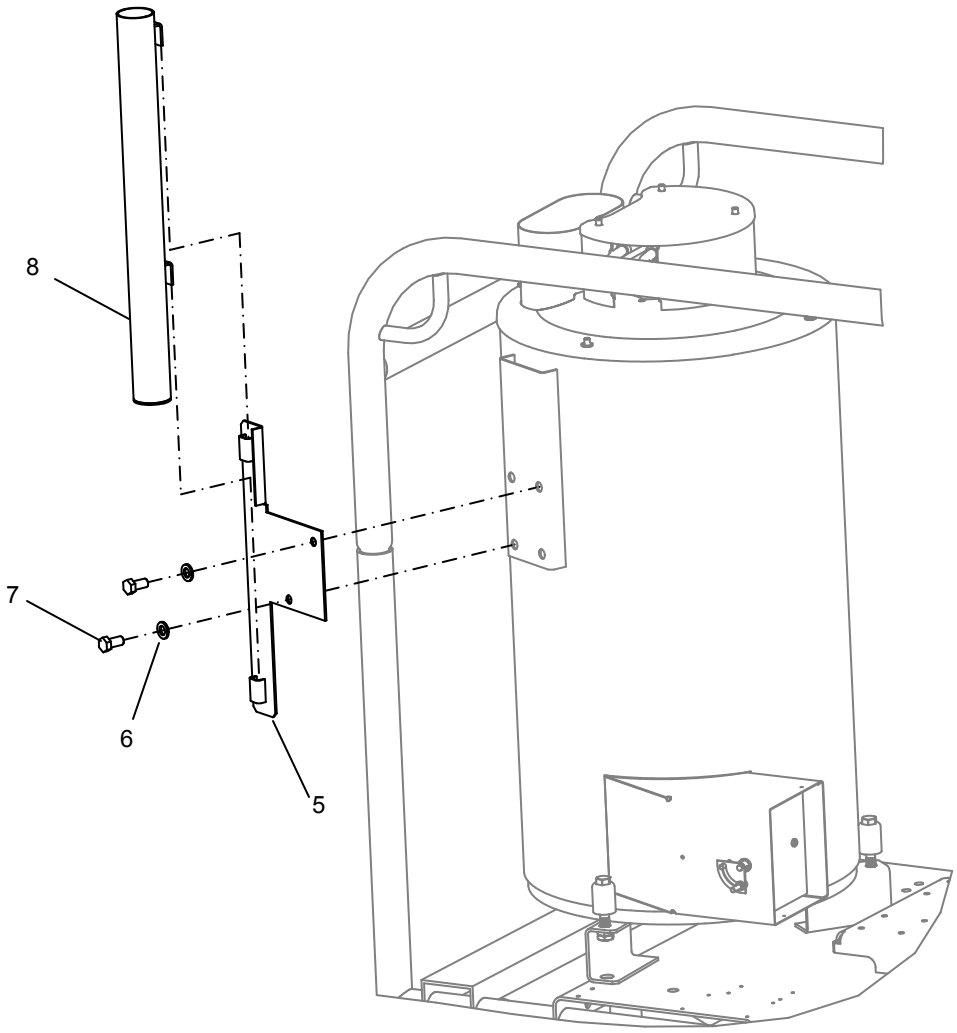


Figure 10. Frame Assembly. (Sheet 2 of 3).

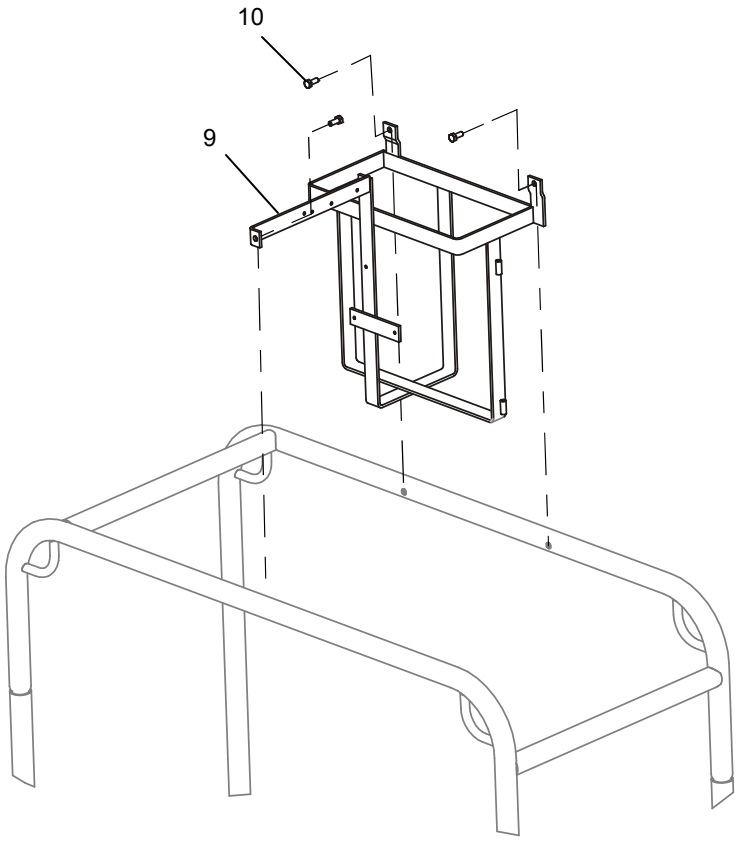


Figure 10. Frame Assembly. (Sheet 3 of 3)

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USUABLE ON CODE (UOC)	(7) QTY
					GROUP 0108	
					FIG. 10 FRAME ASSEMBLY	
*1	PAFZZ	5305-12-374-6857	D0356	7.304-011.0	SCREW, CLOSE TOLERANCE	8
*2	XBFFF	2540-01-596-0159	D0356	120K2274	HANDLE, MANUAL	8
3	XAFZZ		98255	120K2273	.HANDLE	8
4	PAFZZ	4920-01-573-9789	39428	9282K17	.GRIP, FOAM	8
5	PAFZZ	4940-12-374-9077	D0356	4.042-281.0	OWNER, NOZZLE	1
*6	PAFZZ	5310-12-142-0658	D8286	DIN127-B8-FST-A3P	WASHER, LOCK	2
7	PAFZZ	5305-12-156-4863	D0356	7.304-397.0	SCREW, CAP, HEXAGON	2
8	PAFZZ	5340-12-379-3703	D0356	4.006-033.0	BRACKET, MOUNTING	1
*9	PAFZZ	7240-12-374-6151	D0356	3.006-001.0	CRADLE, MILITARY CAN AND CALCIUM INHIBITOR	1
*10	PAFZZ	5305-12-374-8107	D0356	6.304-163.0	SCREW, CAP, SOCKET H	3
					END OF FIGURE	

END OF WORK PACKAGE

FIELD MAINTENANCE
ACCESSORY KIT

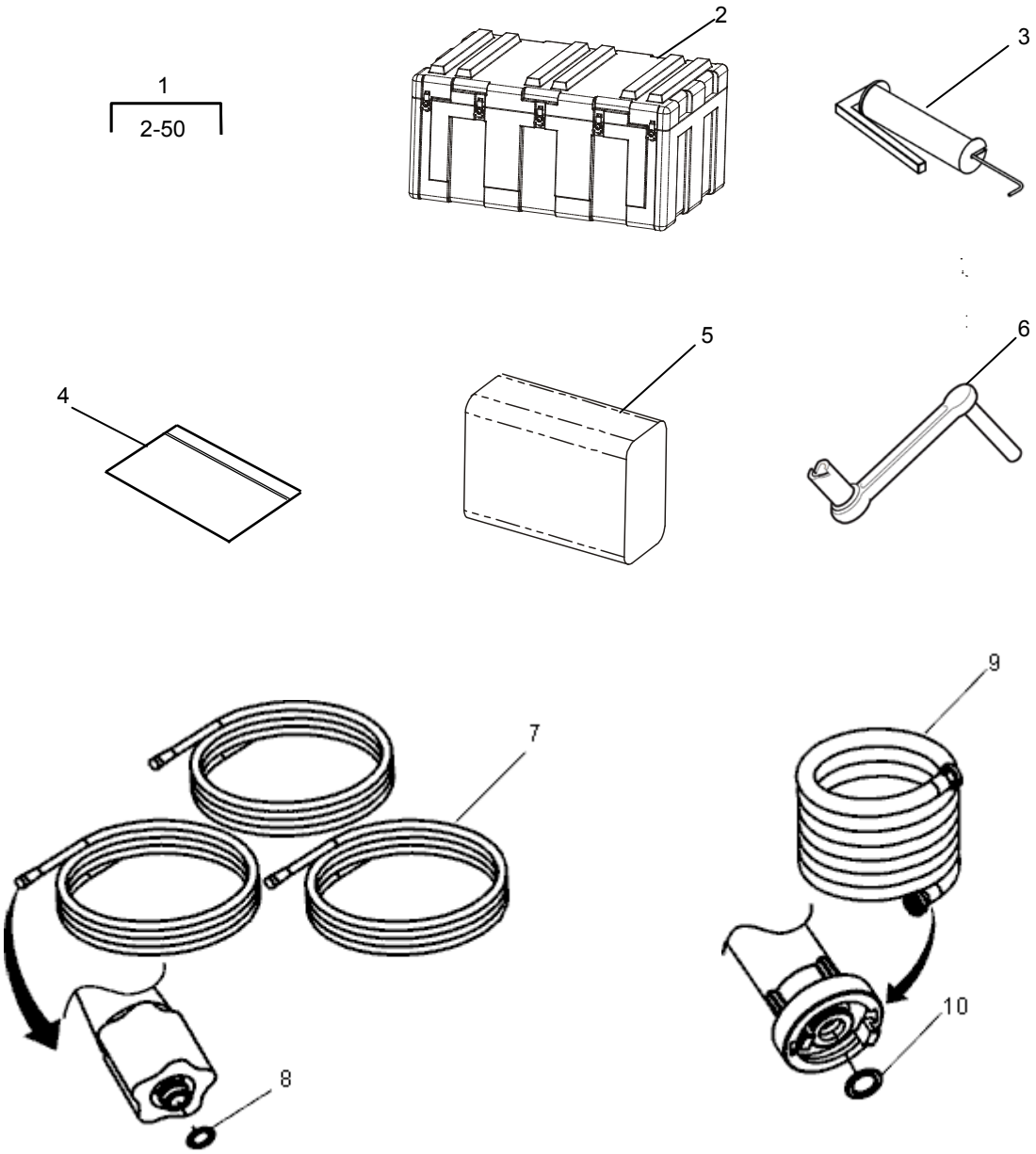


Figure 11. Accessory Kit. (Sheet 1 of 5).

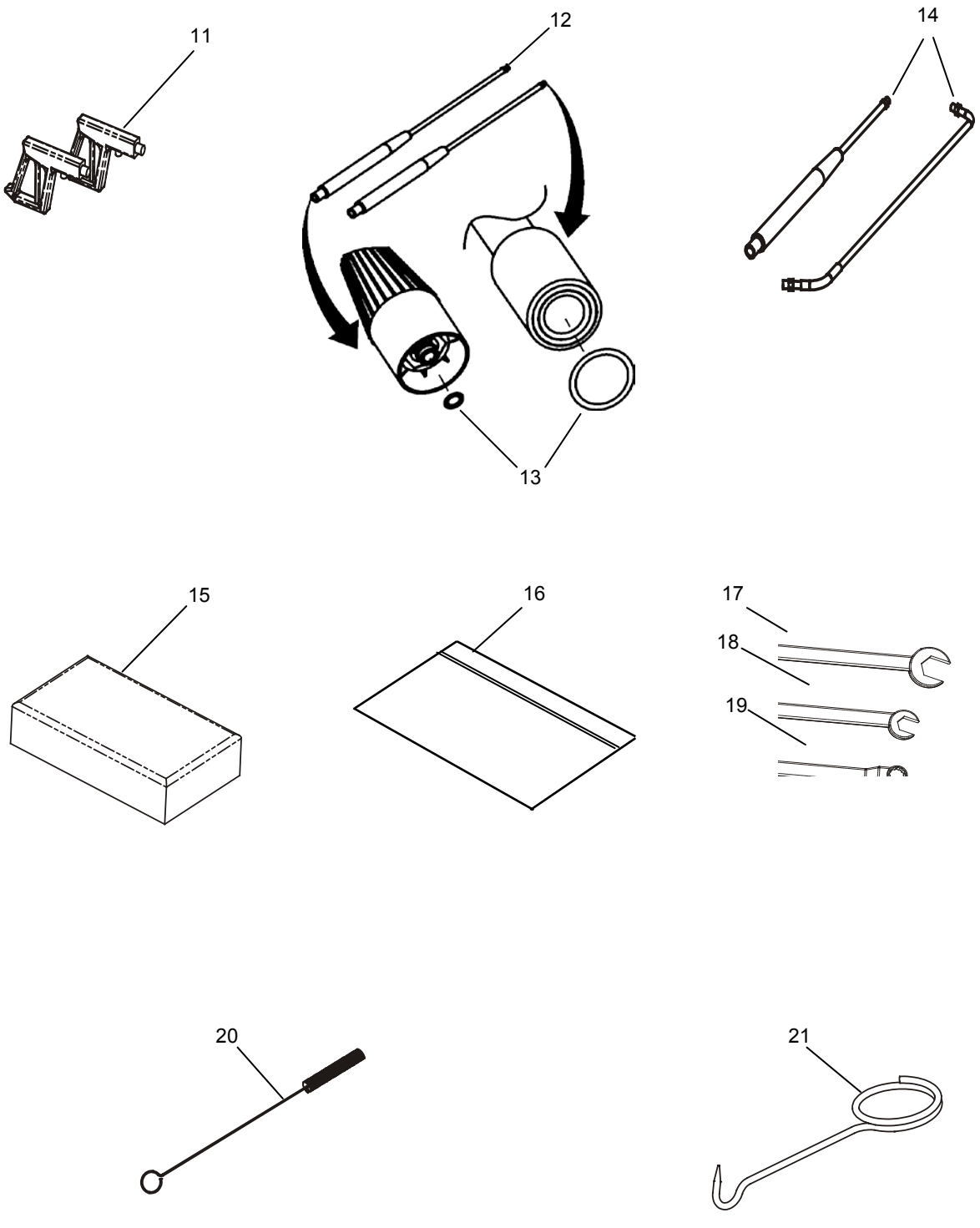


Figure 11. Accessory Kit. (Sheet 2 of 5)

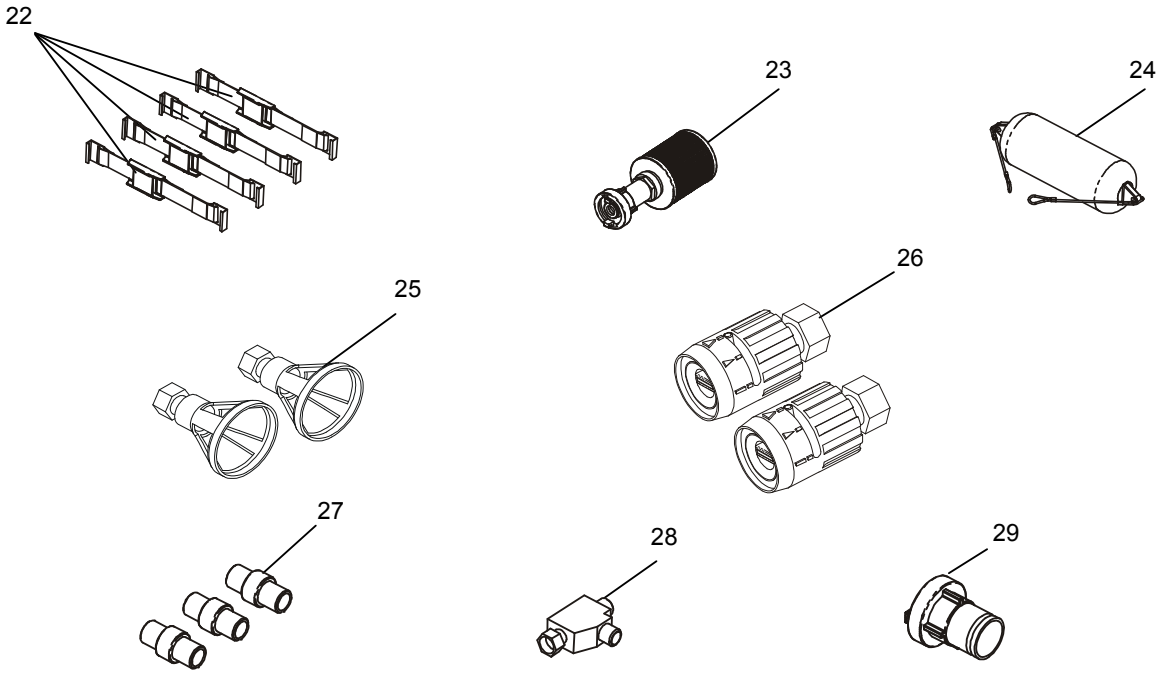


Figure 11. Accessory Kit. (Sheet 3 of 5).

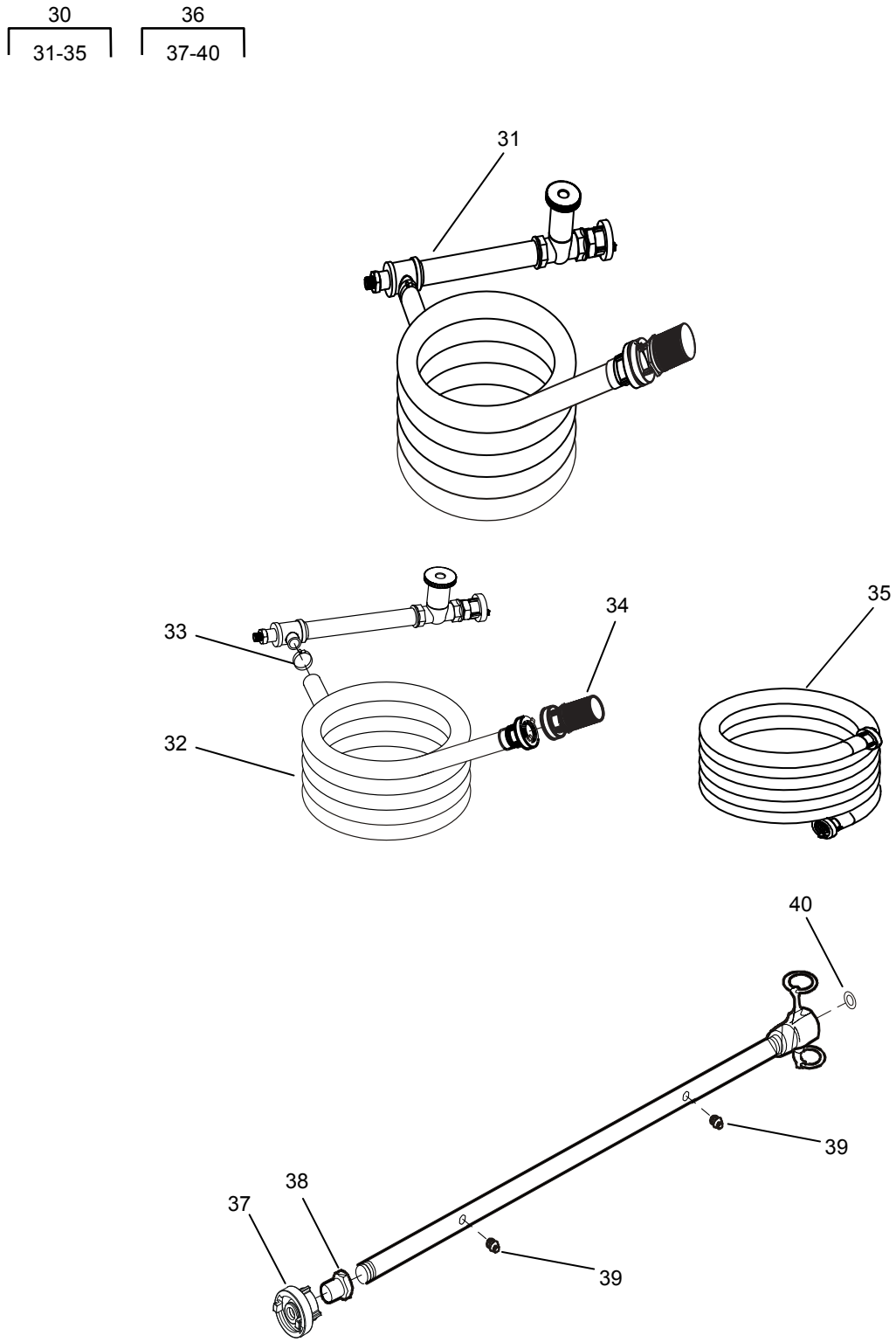


Figure 11. Accessory Kit. (Sheet 4 of 5).

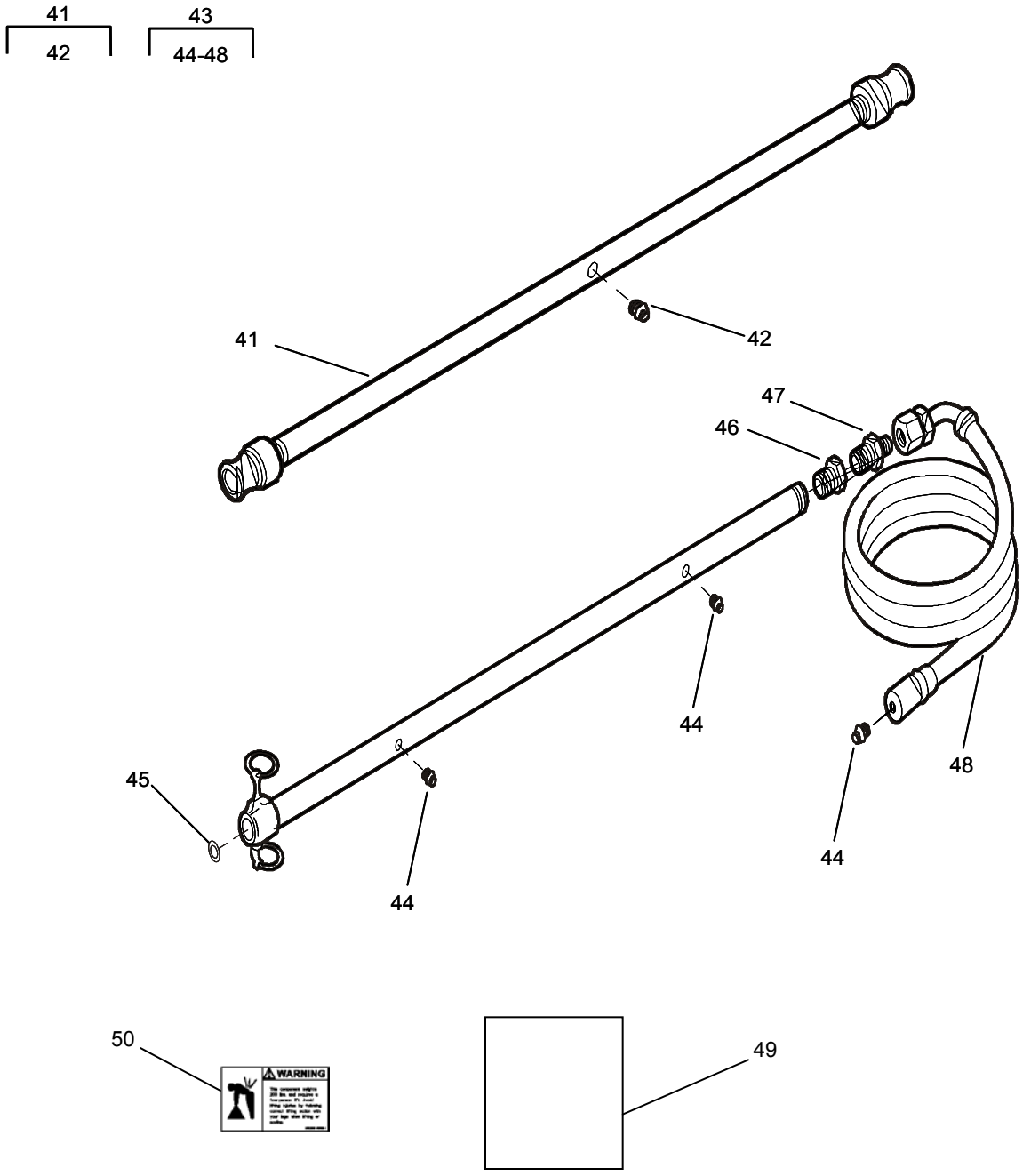


Figure 11. Accessory Kit. (Sheet 5 of 5).

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6)0 DESCRIPTION AND USUABLE ON CODE (UOC)	(7) QTY
					GROUP 02	
					FIG. 11 ACCESSORY KIT	
*1	XBFFF	ITEM DELETED	5RQL2	91500-100	ACCESSORY KIT	1
*2	PAFZZ	ITEM DELETED	2R341	TMS050202	ACCESSORY CASE	1
*3	PAFZZ	4930-12-374-9073	D0356	6.666-672.0	LUBRICATING GUN	1
*4	PAFZZ	ITEM DELETED	D0356	6.666-689.0	POUCH, MECHANICS TOOL	1
*5	PAFZZ	2540-20-004-8563	36718	PA1646	TARPAULIN	1
*6	PAFZZ	2920-01-596-0094	5VT73	110.272.5	STARTER HANDLE	1
*7	PAFZZ	4720-12-174-8182	D0356	6.388-814.0	HOSE ASSEMBLY, NONMETALLIC	3
*8	PCFZZ		D0356	7.362-501-0	. O-RING	6
9	PAFZZ	4720-12-374-6179	D0356	4.006-014.0	HOSE ASSEMBLY, NONMETALLIC	1
*10	PCFZZ	5330-12-148-8603	D8286	DIN14301-4-DS	.PACKING, PREFORMED	2
*11	PAFZZ	4940-12-379-1988	D0356	4.775-812.0	CLEANING GUN, WATER	2
*12	PAFZZ	4940-12-366-8500	D0356	4.006-044.0	JET PIPE, CLEANING	2
*13	PCFZZ		D0356	7.362-501-0	.O-RING	4
14	PAFZZ	4940-12-376-6246	D0356	4.760-596.0	JET PIPE, CLEANING	1
*15	XDFZZ	ITEM DELETED	D0356	6.395-180.0	TOOL BOX COMPLETE	1
*16	PAFZZ	5140-12-374-7749	D0356	6.666-689.0	POUCH, MECHANIC, TOOL	2
*17	PAFZZ	5120-01-068-5645	15526	3110 24X27MM	WRENCH, OPEN END 24MM X 27MM	1
*18	XDFZZ	5120-01-398-9303	39428	5420A17	WRENCH, OPEN END 17MM X 19MM	1
*19	PAFZZ	5120-01-307-4028	15526	600-17MM X 17MM	WRENCH, COMBINATION, BOX AND OPEN 17MM	1
*20	XBFZZ	7920-01-575-6060	23794	610256	BRUSH CLEANING	1
*21	PAFZZ	5120-01-581-4593	98255	134	PICK, O-RING	1
22	PAFZZ	3990-01-204-3009	0KHZ6	MIL-PRF-71224-1	TIE-DOWN CARGO VEHICLE	4
23	PAFZZ	4730-12-374-6394	D0356	4.734-076.0	STRAINER SUCTION	1
*24	PAFZZ	6680-12-374-6958	D0356	4.006-019.0	FLOAT, SWITCH, LIQUID	1
*25	PAFZZ	4730-12-374-6835	D0356	4.006-012.0	NOZZLE, SPRAY, FLUID	2
*26	PAFZZ	4730-12-190-0890	D0356	4.763-046.0	NOZZLE, SPRAY, FLUID	2
27	PAFZZ	4730-12-321-3059	D0356	4.403-002.0	NIPPLE, TUBE	3
28	PAFZZ	4710-12-374-7542	D0356	4.405-048.0	TUBE, ASSEMBLY, METAL	1
*29	PAFZZ	4730-12-374-9071	D0356	4.421-992.0	COUPLING, HALF QUICK	1
*30	XBFFF		98255	120K2286	SHOWER ASSEMBLY	1
*31	PAFFF	ITEM DELETED	D0356	3.637-026.0	.PARTS KIT, WATER MIX	1
32	PAFZZ	4720-12-331-2766	D0356	5.440-005.0	..HOSE NONMETALLIC	1

(1) ITEM NO.	(2) SMR CODE	(3) NSN	(4) CAGEC	(5) PART NUMBER	(6) DESCRIPTION AND USUABLE ON CODE (UOC)	(7) QTY
*33	PAFZZ	4730-12-374-8181	D0356	7.373-307.0	..CLAMP, HOSE	2
34	PAFZZ	4730-12-331-1635	D0356	6.414-298.0	..STRAINER SUCTION	1
*35	PAFZZ	4720-12-326-7839	D0356	4.440-301.0	.HOSE ASSEMBLY, NONME WATER SUPPLY	1
*36	XBFFF	4510-01-600-5274	81361	5-45-9540	.WATER INLET TUBE ASSEMBLY	1
*37	PAFZZ	4730-12-331-2290	D0356	7.545-005.0	..COUPLING, HOSE	1
*38	PAFZZ	4730-00-196-0940	96906	MS14315-11X	..BUSHING, PIPE	1
*39	PAFZZ	ITEM DELETED	81361	5-45-4921	..NOZZLE, SPRAY, FLUID	2
40	PAFZZ	5330-01-242-2713	58536	AA59326-G-2	..GASKET	1
*41	PAFZZ	4710-01-317-0027	81361	5-45-4868	.TUBE ASSEMBLY, METAL MIDDLE SECTION	1
*42	PAFZZ	ITEM DELETED	81361	5-45-4921	..NOZZLE SPRAY	1
*43	PAFFF	4230-01-316-5626	81361	5-45-4869	.SHOWER ASSEMBLY, HOSE END SECTION	1
*44	PAFZZ	ITEM DELETED	81361	5-45-4921	..NOZZLE SPRAY	3
45	PAFZZ	5330-01-242-2713	58536	AA59326-G-2	..GASKET	1
*46	PAFZZ	4730-00-202-6491	96906	MS14315-2X	..BUSHING, PIPE	1
*47	XBFZZ		81343	010102	..ELBOW-PIPE, BRASS	1
48	PAFZZ	4720-01-173-9491	90598	26047-1	..HOSE ASSEMBLY, NONMETALLIC	1
*49	XBFZZ		98255	91160	LABEL, PACKING LIST	1
*50	XBFZZ		98255	91155	LABEL, COMPONENT WEIGHT	1
TBD	XBFZZ		94833	120K2080	LABEL, IUID	1
TBD	PAOZZ	5120-01-436-2924	45152	1350180	WRENCH, ADJUSTABLE	1
TBD	PAOZZ	5120-01-434-9997	96508	R144	SCREWDRIVER, FLAT	1
TBD	PAOZZ	5120-00-240-8716	96508	X101	SCREWDRIVER, CROSSTIP	1
TBD	PAFZZ	4820-12-331-3978	D0356	4.590-057.0	VALVE, SAFETY RELIEF	1

END OF FIGURE

END OF WORK PACKAGE

78FIELD MAINTENANCE
NATIONAL STOCK NUMBER INDEX

STOCK NUMBER	FIG.	ITEM
*4730-00-202-6491	11	46
4730-00-196-0940	11	38
5120-01-068-5645	11	17
4720-01-173-9491	11	48
3990-01-204-3009	11	22
5330-01-242-2713	11	40
	11	45
4730-01-295-8136	11	39
	11	42
	11	44
5120-01-307-4028	11	19
4230-01-316-5626	11	43
4710-01-317-0027	11	41
*6140-01-378-8232	5	50
5310-01-414-7135	9	98
5305-01-446-7915	9	58
5305-01-466-6467	8	23
5310-01-517-9646	9	72
5310-01-526-3331	9	87
5310-01-533-3780	9	100
5305-01-534-7812	9	68
5310-01-553-5299	9	89
5310-01-554-5594	8	26
5310-01-559-8870	3	32
	8	25
	9	70
8145-01-566-8747	11	2
5315-01-569-7268	7	9
5305-01-573-2441	8	28
4920-01-573-9789	10	4
5310-01-574-2139	8	27
5940-01-574-3922	5	62
5940-12-120-8177	5	51
5940-12-120-8178	5	52
5330-12-122-1946	3	4
4730-12-124-1297	9	54
5315-12-124-4346	9	81
5920-12-124-7829	5	33
4730-12-130-7821	7	10
4730-12-131-3728	7	14
4730-12-132-5661	7	13
5330-12-133-9431	3	19
5305-12-141-9850	3	28
	5	12
	9	80
5310-12-142-0481	3	33
	8	24
	9	69
	9	101
*5310-01-397-8096	9	66
5310-12-142-0645	5	14
	9	73
	9	103
5310-12-142-0658	3	27
	5	13
	9	79
	10	6
5310-12-142-0659	3	13
	3	30
	4	7
	8	5
	8	22
	9	65
	9	84
	9	94
5305-12-142-2958	9	76
*5305-12-142-8221	3	35
5930-12-144-4651	5	19
6680-12-144-4633	3	31
5340-12-146-1815	7	18
5310-12-148-0603	9	78
5360-12-148-8267	8	6
5310-12-148-8286	8	3
	8	21
5330-12-148-8603	11	10

STOCK NUMBER	FIG.	ITEM
5330-12-150-9938	9	55
	9	61
5310-12-151-4065	9	14
5330-12-156-4521	9	21
	9	25
	9	33
*5330-12-122-1746	3	8
	3	16
5305-12-156-4863	10	7
5305-12-156-4872	6	24
5310-12-156-4912	4	12
	5	45
	5	47
5310-12-156-4991	5	27
	5	34
	9	64
	9	95
5310-12-156-4996	3	36
5310-12-159-4923	9	37
5340-12-159-5154	7	21
4730-12-163-3346	9	4
3030-12-166-2117	3	38
2910-12-166-8646	6	16
5310-12-168-9828	5	9
	5	16
4730-12-169-1435	7	12
3040-12-169-2891	4	5
4720-12-174-8182	11	7
5310-12-179-2417	9	28
5340-12-185-4872	9	46
4730-12-190-0890	11	26
4710-12-196-2453	9	59
6680-12-196-3154	9	17
5310-12-196-3160	9	13
5310-12-196-5816	6	8
5365-12-196-7017	9	3
5920-12-198-4234	5	30
3040-12-305-2617	4	3
5945-12-306-6516	5	25
*4940-12-379-1988	11	11

STOCK NUMBER	FIG.	ITEM
5977-12-307-4847	8	13
5920-12-308-4126	5	31
5340-12-308-8593	8	18
5340-12-309-0198	8	14
6680-12-309-0205	5	37
4730-12-309-0320	6	11
3020-12-309-1671	3	26
3010-12-309-1672	3	25
4820-12-309-2768	6	12
5330-12-312-9251	8	10
5945-12-312-9977	5	29
5920-12-313-0640	5	32
2910-12-314-8154	9	2
2920-12-318-3329	9	43
5330-12-318-4892	9	16
5330-12-318-4895	9	50
5330-12-318-6412	9	11
4730-12-321-3059	11	27
2940-12-321-6174	9	48
6680-12-322-2860	8	17
5977-12-324-1650	8	11
5945-12-324-5690	5	38
5330-12-324-6761	9	34
3040-12-324-8076	9	105
4320-12-324-9142	4	15
3030-12-324-9252	4	14
4720-12-326-7839	11	35
5975-12-329-1919	4	10
5340-12-330-8235	5	39
2990-12-330-8308	9	63
4140-12-330-8395	4	13
5365-12-330-9207	4	4
4720-12-330-9290	7	3
4720-12-330-9291	7	4
4720-12-330-9293	7	5
4530-12-330-9506	8	29
5330-12-331-0112	3	15
5330-12-331-0174	8	16
3010-12-331-0768	4	2
2910-12-331-0909	9	51

STOCK NUMBER	FIG.	ITEM
5950-12-331-1526	5	46
5330-12-331-1616	9	44
	9	71
4730-12-331-1635	11	34
6130-12-331-1721	5	41
4730-12-331-1874	6	17
4730-12-331-2045	7	6
4730-12-331-2290	11	37
4720-12-331-2766	11	32
2940-12-331-3434	9	39
2940-12-331-3435	9	40
2940-12-331-3436	9	41
2940-12-331-3742	9	36
4730-12-331-4224	7	17
4820-12-331-4486	3	6
* ITEM DELETED	8	15
4510-12-332-1969	11	31
4730-12-339-2836	6	21
5945-12-339-5010	5	26
5365-12-342-1219	9	12
2940-12-342-1512	9	20
6160-12-349-6563	5	54
6160-12-349-6564	5	53
5310-12-350-7011	9	57
5310-12-350-7077	9	52
5310-12-350-7078	9	31
5310-12-350-7079	9	53
5310-12-350-7085	9	30
3020-12-350-8874	9	77
5340-12-350-9198	9	82
5340-12-351-0372	7	16
3040-12-351-0942	9	75
4820-12-351-0948	6	22
*5530-12-350-0550	6	13
5305-12-351-3680	5	44
4940-12-351-6532	8	4
4720-12-351-7522	7	2
5340-12-351-7593	5	5
5305-12-351-8765	9	5
5310-12-351-8861	9	9

STOCK NUMBER	FIG.	ITEM
4530-12-353-3369	8	9
	8	12
5980-12-353-4375	8	20
4730-12-353-7960	9	60
5307-12-357-6016	9	42
2940-12-357-6358	9	45
5340-12-357-6359	9	38
5310-12-365-7038	7	19
5340-12-371-2188	4	9
3040-12-371-3949	9	104
4730-12-372-8569	3	11
7240-12-374-6151	10	9
4720-12-374-6179	11	9
4730-12-374-6282	6	19
4730-12-374-6339	7	7
4730-12-374-6352	6	18
4730-12-374-6394	11	23
5930-12-374-6556	5	18
2920-12-374-6569	5	49
6685-12-374-6574	5	20
6645-12-374-6600	5	40
*6685-01-583-1253	3	18
5980-12-374-6611	5	23
5930-12-374-6647	7	8
5305-12-374-6784	7	15
4730-12-374-6835	11	25
5305-12-374-6857	10	1
6680-12-374-6958	11	24
5340-12-374-7007	5	15
4720-12-374-7104	6	15
4720-12-374-7134	6	6
4710-12-374-7542	11	28
5980-12-374-7568	5	22
5310-12-374-7633	9	8
5365-12-374-7653	3	7
5305-12-374-7667	5	17
	5	42
	5	48
5310-12-374-7725	9	47
4820-12-374-7747	9	27

STOCK NUMBER	FIG.	ITEM
5140-12-374-7749	11	4
	11	16
4710-12-374-7751	9	23
5340-12-374-7755	9	6
5307-12-374-7770	9	29
2920-12-374-7995	5	43
4820-12-374-8013	9	35
4730-12-374-8020	3	5
	6	10
5980-12-374-8043	5	21
4710-12-374-8092	6	5
5305-12-374-8107	10	10
4720-12-374-8125	6	20
5306-12-374-8166	3	34
4730-12-374-8181	11	33
4310-12-374-8212	3	3
4720-12-374-9049	6	7
4730-12-374-9071	11	29
4930-12-374-9073	11	3
4940-12-374-9077	10	5
4730-12-374-9097	3	24
5310-12-374-9110	9	102
4820-12-374-9113	3	23
5305-12-374-9143	3	12
	3	29
	4	8
	9	67
	9	85
5310-12-374-9182	5	35
5340-12-374-9559	9	32
2920-12-375-1690	9	7
4320-12-375-2254	3	1
4410-12-375-2256	8	1
4140-12-375-2293	4	1
2815-12-376-3027	9	1
4730-12-376-6228	3	21
*	6	8
4940-12-376-6246	11	14
5930-12-376-6359	6	1
5305-12-376-6861	7	20

STOCK NUMBER	FIG.	ITEM
4940-12-378-9169	9	93
5305-12-379-0576	4	11
4730-12-379-0654	9	56
4730-12-379-0654	9	62
2920-12-379-0659	9	10
4730-12-379-1127	3	22
4710-12-379-1592	9	24
4820-12-379-1615	3	10
5331-12-379-2144	6	3
5360-12-379-2669	3	9
5340-12-379-3703	10	8
4730-12-379-4470	6	2
4940-12-379-5945	9	26
4940-12-386-8500	11	12
2540-20-004-8563	11	5
*7240-01-337-5269	1	2
*8145-01-566-8747	1	3
*5430-01-543-0155	1	4

FIELD MAINTENANCE
PART NUMBER INDEX

PART NUMBER	FIG.	ITEM
010102	11	47
91146	8	8
91147	8	2
91148	9	91
91149	9	90
91150	5	11
91151	5	7
91152	9	92
91153	5	4
91154	5	6
91155	11	50
91156	9	49
91157	3	2
91158	8	7
91159	5	3
91160	11	49
*ITEM DELETED	5	54
110.272.5	11	6
120K2273	10	3
120K2274	10	2
*5-45-9540	11	36
120K2286	11	30
175.078.1	9	51
18B 437 0117 M5	9	1
2.641-231.0	3	1
2.641-232.0	4	1
2.641-234.0	8	1
2.641-237.0	7	1
*2.642-077.0	5	1
2.880-177.0	8	13
7.362-501-0	11	8
	11	13
240SK16M	3	31
26047-1	11	48
3.006-001.0	10	9
3.063-006.0	7	7
*ITEM DELETED	11	31
3110 24X27MM	11	17
*4.006-011.0	6	20
4.006-012.0	11	25
4.006-014.0	11	9
4.006-019.0	11	24
4.006-033.0	10	8
4.006-044.0	11	12
4.038-170.0	9	82
4.042-281.0	10	5
4.063-0950	3	14
4.066-135.0	8	4
4.392-019.0	4	13
4.403-002.0	11	27
4.405-048.0	11	28
4.412-004.0	3	21
*	6	8
*4.421-981.0	6	5
4.421-992.0	11	29
4.440-301.0	11	35
*4.580-036.0	6	12
*4.580-147.0	6	22
4.654-115.0	8	29
4.734-076.0	11	23
4.749-178.0	6	1
4.760-596.0	11	14
4.763-046.0	11	26
4.821-049.0	5	49
4.826-031.0	8	11
466.008.4	9	3
5.000-403.0	8	18
5.009-113.0	9	93
5.009-138.0	9	96
5.018-273.0	7	16
5.034-276.0	9	74
5.063-281.0	5	5
5.063-282.0	5	15
5.106-024.0	9	75
5.110-300.0	3	37
5.127-010.0	8	14

PART NUMBER	FIG.	ITEM
*5.131-019.0	6	17
5.332-537.0	3	9
5.335-001.0	8	6
5.364-039.0	3	15
5.364-100.0	8	16
5.383-853.0	5	2
5.411-176.0	6	4
5.423-337.0	7	11
5.440-005.0	11	32
5.471-055.0	4	4
*5.574-027.0	6	13
5.581-299.0	3	7
5.582-138.0	3	10
*ITEM DELETED	3	6
5.602-021.0	4	6
5.625-100.0	3	26
5.625-206.0	9	77
5.669-010.0	8	20
5.696-002.0	7	17
*134	11	21
*610256	11	20
512.158.2	9	42
514.037.4	9	13
514.061.2	9	8
514.093.2	9	37
515.086.6	9	56
	9	62
515.356.2	9	60
515.357.2	9	54
515.426.4	9	26
541.038.2	9	2
541.050.2	9	20
541.052.2	9	48
541.056.2	9	41
541.057.2	9	40
541.058.2	9	39
541.059.2	9	38
5420A17	11	18
5-45-4868	11	41
5-45-4869	11	43

PART NUMBER	FIG.	ITEM
*ITEM DELETED	11	39
*ITEM DELETED	11	42
*ITEM DELETED	11	44
547.465.6	9	7
547.469.1	5	43
555.122.2	9	43
555.129.1	9	46
555.173.1	9	27
555.203.2	9	35
6.178-002.0	4	9
6.278-014.0	8	17
6.304-163.0	10	10
*ITEM DELETED	3	4
6.363-298.0	6	3
6.366-006.0	8	10
6.369-997.0	3	20
6.373-310.0	7	18
6.373-382.0	9	104
6.386-157.0	7	10
6.386-160.0	7	12
6.386-163.0	7	6
6.386-346.0	7	13
*6.388-423.0	6	11
*6.388-537.0	6	19
*6.388-544.0	6	14
*6.388-559.0	6	21
6.388-608.0	4	10
6.388-814.0	11	7
6.388-901.0	7	4
6.388-902.0	7	5
6.388-903.0	9	63
6.388-984.0	7	3
6.389-036.0	7	2
*6.391-373.0	6	15
*6.391-377.0	6	18
*6.391-378.0	6	7
50695851	3	18
6.391-380.0	3	22
*6.391-449.0	6	6
*ITEM DELETED	11	15

PART NUMBER	FIG.	ITEM
6.413-431.0	3	23
6.414-298.0	11	34
*6.414-413.0	6	16
6.414-821.0	6	2
*ITEM DELETED	8	9
*6.415-053.0	8	12
6.417-014.0	3	24
6.431-032.0	9	105
6.463-009.0	4	5
*ITEM DELETED	4	3
6.463-021.0	4	2
6.465-006.0	3	25
6.472-382.0	4	15
6.621-025.0	5	41
6.622-100.0	5	46
6.631-017.0	5	19
6.631-376.0	7	8
6.632-065.0	5	25
6.633-109.0	5	37
6.633-216.0	5	26
6.633-217.0	5	29
6.633-221.0	5	38
6.642-059.0	5	53
6.644-052.0	5	33
6.646-046.0	5	39
6.654-008.0	5	51
6.654-009.0	5	52
6.664-024.0	8	15
6.666-671.0	5	40
6.666-672.0	11	3
6.666-677.0	5	22
6.666-678.0	5	21
6.666-679.0	5	23
*ITEM DELETED	11	4
6.666-689.0	11	16
*SBO2100 0,75 E2/4 26U-210FX040	3	3
*ITEM DELETED	5	24
6.686-403.0	5	20
*555,127.2	9	22
6.986-685.0	5	18
6.996-979.0	7	21
600-17MM X 17MM	11	19
624.099.4	9	45
651.32.4	9	15
6948K713	5	55
*ITEM DELETED	5	57
*ITEM DELETED	5	59
*4.775-812.0	11	11
7.303-036.0	5	17
*ITEM DELETED	5	42
*ITEM DELETED	5	48
7.303-039.0	5	44
7.303-252.0	3	34
7.304-011.0	10	1
*91280A643	3	35
7.304-397.0	10	7
7.304-399.0	3	28
*91280A342	5	12
*	9	80
*7.304-415.0	6	24
7.306-071.0	4	11
7.306-089.0	5	28
7.306-090.0	3	12
	3	29
	4	8
	9	67
	9	85
7.306-106.0	9	76
7.306-118.0	7	20
7.307-213.0	7	15
7.311-003.0	5	27
*ITEM DELETED	5	34
*4536226-786	9	64
	9	95
7.311-006.0	3	36
*7.311-155.0	6	9
7.311.380.0	8	3
*ITEM DELETED	8	21
*ISO10511-M6-A4-70	7	19
7.311-427.0	9	102

PART NUMBER	FIG.	ITEM
*91166A240	4	12
	5	45
*ITEM DELETED	5	47
*91166A280	9	66
*12529588	5	14
	9	73
	9	103
*91166A280	3	33
	8	24
	9	69
	9	101
7.312-167.0	5	35
7.312-261.0	9	78
7.312-278.0	5	9
*ITEM DELETED	5	16
*DIN127-B6-FST-A3P	3	13
	3	30
	4	7
	8	5
*ITEM DELETED	8	22
*DIN127-B6-FST-A3P	9	65
	9	84
*ITEM DELETED	9	94
*DIN127-B8-FST-A3P.0	3	27
	5	13
	9	79
	10	6
7.318-042.0	9	81
7.348-072.0	4	14
7.348-106.0	3	38
*6.362-228.0	3	8
7.362-023.0	3	19
7.373-307.0	11	33
7.382-005.0	3	17
*DIN7631-12-X6CRNIMOTI 17-12-2	3	5
*	6	10
7.386-121.0	7	14
7.545-005.0	11	37
7.545-010.0	3	11
DIN14301-4-DS	11	10

PART NUMBER	FIG.	ITEM
*7.362-009.0	3	16
7.644-005.0	5	31
7.644-007.0	5	30
7.644-012.0	5	32
*MS20659-174	5	56
*ITEM DELETED	5	58
*ITEM DELETED	5	60
7113K826	5	62
71245K54	5	61
741.144.5	9	36
762.106.5	9	17
770.142.4	9	16
770.158.4	9	44
	9	71
*8002-002/MDL NO.34	5	50
847.123.4	9	50
850.066.4	9	11
890.10.05	9	30
890.11.03	9	52
890.11.05	9	9
890.28.17	9	29
890.30.03	9	19
890.31.35	9	5
890.38.03	9	53
890.38.05	9	31
890.47.51	9	47
890.74.04	9	57
890.74.06	9	55
	9	61
890.74.16	9	21
	9	25
	9	33
890.74.17	9	34
890.92.01	9	28
90576A104	5	10
90576A115	9	98
90576A118	3	32
*90576A118	8	25
	9	70
90591A171	8	26

PART NUMBER	FIG.	ITEM
90695A041	8	27
90965A170	9	87
91100A150	9	83
91202A242	9	100
91280A238	5	8
91280A322	9	58
91280A630	8	23
91280A648	9	99
91280A649	8	28
91280A656	9	68
*91420A126	6	23
*ITEM DELETED	11	1
91828A410	9	72
922.072.2	9	4
923.934.4	9	6
92320A667	9	88
9282K17	10	4
*ITEM DELETED	5	36
93635A235	9	86
94205A250	9	89
945.039.4	9	10
96817A310	8	19
971.321.5	9	59
971.367.5	9	24
98338A110	7	9
995.159.6	9	32
AA59326-G-2	11	40
	11	45
DIN125-A8, 4-PA	9	14
DIN7603-A17X23C	9	18
E509.018.4	9	12
E971.254.5	9	23
MIL-PRF-71224-1	11	22
MS14315-11X	11	38
MS14315-2X	11	46
PA1646	11	5
*ITEM DELETED	11	2
*91000-100	1	1
*10502788	1	2

PART NUMBER	FIG.	ITEM
TM5050202	1	3
RCF-3K-OT-OP	1	4
*10902B	5	TBD
*6.414-136	6	TBD
*6.388-225.0	6	TBD
*6.388-196.0	6	TBD
*5.025-747.0	6	TBD
*922.077.2	9	TBD
*850.067.4	9	TBD
*770.273.5	9	TBD
*770.168.4	9	TBD
*928.054.4	9	TBD
*5.132-011.0	3	TBD

CHAPTER 5

SUPPORTING INFORMATION FOR DECONTAMINATING APPARATUS: JOINT SERVICE TRANSPORTABLE SMALL SCALE, M26

FIELD MAINTENANCE
REFERENCES

SCOPE

This work package lists all field manuals, forms, technical manuals, and miscellaneous publications referenced in this manual.

DA PAMPHLETS

DA PAM 750-8	The Army Maintenance Management Systems (TAMMS) Users Manual

FIELD MANUALS

FM 3-11.5	Multiservice Tactics, Techniques, and Procedures for Chemical, Biological, Radiological and Nuclear Decontamination
FM 3-11.3	Multiservice Tactics, Techniques, and Procedures for Nuclear, Biological, and Chemical Contamination Avoidance
FM 3-11.19	Multiservice Tactics, Techniques, and Procedures for Nuclear, Biological, and Chemical Reconnaissance

FORMS

DA Form 5988E	Equipment Inspection and Maintenance Worksheet
DA Form 2062	Hand Receipt
DA Form 2028	Recommended Changes to Publications and Blank Forms
DA Form 2404	Equipment Inspection and Maintenance Worksheet
SF 368	Product Quality Deficiency Report
SF 364	Report of Discrepancy

TECHNICAL MANUALS

TM 3-4230-238-10	Operator Maintenance Manual for Decontaminating Apparatus: Transportable Small Scale, M-26
TM 10-5430-237-12&P	Tank, Fabric, Collapsible, Self-Supporting, Sealed Top, Water Storage, 3000 Gallons Model GTA-Z60TPW/Model 3-K-W-A-A/Z
TM 43-0002-31	Destruction of Chemical Weapons and Defense Equipment to Prevent Enemy Use
TM 750-244-6	Destruction of TACOM Equipment

OTHER REFERENCES

AR 735-11-2	Army Regulation: Reporting of Supply Discrepancies
CTA 50-909	Field and Garrisons Furnishings and Equipment
CTA 50-970	Expendable/Durable Items (Except: Medical, Class V, Repair Parts, and Heraldic Items
CTA 8-100	Army Medical Department Expendable/Durable Items

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
MAINTENANCE ALLOCATION CHART (MAC) INTRODUCTION

THE ARMY MAINTENANCE SYSTEM MAC

This introduction provides a general explanation of all maintenance and repair functions authorized at the two maintenance levels under the Two-Level Maintenance System concept.

The MAC (immediately following the introduction) designates overall authority and responsibility for the performance of maintenance functions on the identified end item or component. The application of the maintenance functions to the end item or component shall be consistent with the capacities and capabilities of the designated maintenance levels, which are shown on the MAC in column (4) as:

Field — includes two subcolumns, Crew (C) and Maintainer (F).

Sustainment — includes two subcolumns, Below Depot (H) and Depot (D).

The maintenance to be performed at field and sustainment levels is described as follows:

1. Crew maintenance. The responsibility of a using organization to perform maintenance on its assigned equipment. It normally consists of inspecting, servicing, lubricating, adjusting, and replacing parts, minor assemblies, and subassemblies. The replace function for this level of maintenance is indicated by the letter “C*” in the third position of the SMR code. A “C” appearing in the fourth position of the SMR code indicates complete repair is possible at the crew maintenance level.
2. Maintainer maintenance. Maintenance accomplished on a component, accessory, assembly, subassembly, plug-in unit, or other portion either on the system or after it is removed. The replace function for this level of maintenance is indicated by the letter “F” appearing in the third position of the SMR code. An “F” appearing in the fourth position of the SMR code indicates complete repair is possible at the field maintenance level. Items are returned to the user after maintenance is performed at this level.
3. Below depot sustainment. Maintenance accomplished on a component, accessory, assembly, subassembly, plug-in unit, or other portion either on the system or after it is removed. The replace function for this level of maintenance is indicated by the letter “H” appearing in the third position of the SMR code. An “H” appearing in the fourth position of the SMR code indicates complete repair is possible at the below depot sustainment maintenance level. Items are returned to the supply systems after maintenance is performed at this level.
4. Depot sustainment. Maintenance accomplished on a component, accessory, assembly, subassembly, plug-in unit, or other portion either on the system or after it is removed. The replace function for this level of maintenance is indicated by the letter “D” or “K” appearing in the third position of the SMR code. Depot sustainment maintenance can be performed by either depot personnel or contractor personnel. A “D” or “K” appearing in the fourth position of the SMR code indicates complete repair is possible at the depot sustainment maintenance level. Items are returned to the supply systems after maintenance is performed at this level.

The tools and test equipment requirements (immediately following the MAC) list the tools and test equipment (both special tools and common tool sets) required for each maintenance function as referenced from the MAC.

The remarks (immediately following the tools and test equipment requirements) contain supplemental instructions and explanatory notes for a particular maintenance function.

MAINTENANCE FUNCTIONS

Maintenance functions are limited to and defined as follows:

1. Inspect. To determine the serviceability of an item by comparing its physical, mechanical, and/or electrical characteristics with established standards through examination (e.g., by sight, sound, or feel). This includes scheduled inspection and gagings and evaluation of cannon tubes.
2. Test. To verify serviceability by measuring the mechanical, pneumatic, hydraulic, or electrical characteristics of an item and comparing those characteristics with prescribed standards on a scheduled basis, i.e., load testing of lift devices and hydrostatic testing of pressure hoses.
3. Service. Operations required periodically to keep an item in proper operating condition; e.g., to clean (includes decontaminate, when required), to preserve, to drain, to paint, or to replenish fuel, lubricants, chemical fluids, or gases. This includes scheduled exercising and purging of recoil mechanisms. The following are examples of service functions:
    a. Unpack. To remove from packing box for service or when required for the performance of maintenance operations.
    b. Repack. To return item to packing box after served and other maintenance operations.
    c. Clean. To rid the item of contamination.
    d. Touch up. To spot paint scratched or blistered surfaces.
    e. Mark. To restore obliterated identification.
4. Adjust. To maintain or regulate, within prescribed limits, by bringing into proper position, or by setting the operating characteristics to specified parameters.
5. Align. To adjust specified variable elements of an item to bring about optimum or desired performance.
6. Calibrate. To determine and cause corrections to be made or to be adjusted on instruments or test, measuring, and diagnostic equipment used in precision measurement. Consists of comparisons of two instruments, one of which is a certified standard of known accuracy, to detect and adjust any discrepancy in the accuracy of the instrument being compared.
7. Remove/Install. To remove and install the same item when required to perform service or other maintenance functions. Install may be the act of emplacing, seating, or fixing into position a spare, repair part, or module (component or assembly) in a manner to allow the proper functioning of an equipment or system.
8. Paint (ammunition only). To prepare and spray color coats of paint so that the ammunition can be identified and protected. The color indicating primary use is applied, preferably, to the entire exterior surface as the background color of the item. Other markings are to be repainted as original so as to retain proper ammunition identification.
9. Replace. To remove an unserviceable item and install a serviceable counterpart in its place. “Replace” is authorized by the MAC and assigned maintenance level is shown as the third position code of the Source, Maintenance and Recoverability (SMR) code.
10. Repair. The application of the maintenance services, including fault location/troubleshooting, removal/ installation, disassembly/assembly procedures, and maintenance actions to identify troubles and restore serviceability to an item by correcting specific damage, fault, malfunction, or failure in a part, subassembly, module (component or assembly), end item, or system.

MAINTENANCE FUNCTIONS - CONTINUED

NOTE

The following deÿnitions are applicable to the "repair" maintenance function:

- Services. Inspect, test, service, adjust, align, calibrate, and/or replace.
- Fault location/troubleshooting. The process oÿ nvestigating and detecting the cause of equipment malfunctioning: the act oÿ solating a fault within a system or Unit Under Test (UUT).
- Disassembly/assembly. The step-by-step breakdown (taking apart) of a spare/functional group coded item to the level oÿ ts least component, that is assigned an SMRcode for the level of maintenance under consideration (i.e., identiÿed as maintenance signiÿcant).
- Actions. Welding, grinding, riveting, straightening, facing, machining, and/or resurfacing.

11. Overhaul. That maintenance e° ort (service/action) prescribed to restore an item to a completely serviceable/operational condition as required by maintenance standards in appropriate technical publications. Overhaul is normally the highest degree of maintenance performed by the Army. Overhaul does not normally return an item to like new condition.
12. Rebuild. Consists of those services/actions necessary for the restoration of unserviceable equipment to a like new condition in accordance with original manufacturing standards. Rebuild is the highest degree of maintenance applied to Army equipment. The rebuild operation includes the act of returning to zero those age measurements (e.g., hours/miles) considered in classifying Army equipment/components.

Explanation of Columns in the MAC

Column (1) Group Number. Column (1) lists Functional Group Code (FGC) numbers, the purpose of which is to identify maintenance signiÿcant components, assemblies, subassemblies, and modules with the Next Higher Assembly (NHA).

Column (2) Component/Assembly. Column (2) contains the item names of components, assemblies, subassemblies, and modules for which maintenance is authorized.

Column (3) Maintenance Function. Column (3) lists the functions to be performed on the item listed in column (2). (For a detailed explanation of these functions refer to "Maintenance Functions" outlined above).

Column (4) Maintenance Level. Column (4) speciÿes each level of maintenance authorized to perform each function listed in column (3), by indicating work time required (expressed as man-hours in whole hours or decimals) in the appropriate sub column. This work time ÿgure represents the active time required to perform that maintenance function at the indicated level of maintenance. If the number or complexity of the tasks within the listed maintenance function varies at di° erent maintenance levels, appropriate work time ÿgures are to be shown for each level. The work time ÿgure represents the average time required to restore an item (assembly, subassembly, component, module, end item, or system) to a serviceable condition under typical ÿeld operating conditions. This time includes preparation time (including any necessary disassembly/assembly time), troubleshooting/fault location time, and quality assurance time in addition to the time required to perform the speciÿc tasks identiÿed for the maintenance functions authorized in the MAC.

MAINTENANCE FUNCTIONS - CONTINUED

The symbol designations for the various maintenance levels are as follows:

Field:

C Crew Maintenance

F Maintainer Maintenance

Sustainment:

L Specialized Repair Activity (SRA)

H Below Depot Maintenance

D Depot Maintenance

NOTE

The "L" maintenance level is not included in column (4) of the MAC. Functions to this level of maintenance are identified by a work time figure in the "H" column of column (4), and an associated reference code is used in the REMARKS column (6). This code is keyed to the remarks and the SRA complete repair application is explained there.

Column (5) Tools and Equipment Reference Code. Column (5) specifies, by code, those common tool sets (not individual tools), common Test, Measurement and Diagnostic Equipment (TMDE), and special tools, special TMDE and special support equipment required to perform the designated function. Codes are keyed to the entries in the tools and test equipment table.

Column (6) Remarks Code. When applicable, this column contains a letter code, in alphabetical order, which is keyed to the remarks table entries.

Explanation of Columns in the Tools and Test Equipment Requirements

Column (1) Tool or Test Equipment Reference Code. The tool or test equipment reference code correlates with a code used in Column 5 of the MAC.

Column (2) Maintenance Level. The lowest level of maintenance authorized to use the tool or test equipment.

Column (3) Nomenclature. Name or identification of the tool or test equipment.

Column (4) National Stock Number (NSN). The NSN of the tool or test equipment.

Column (5) Tool Number. The manufacturer's part number, model number, or type number.

Explanation of the Columns in the Remarks

Column (1) Remarks Code. The code recorded in column 6 of the MAC.

Column (2) Remarks. This column lists information pertinent to the maintenance function being performed as indicated in the MAC.

END OF WORK PACKAGE

FIELD MAINTENANCE
MAINTENANCE ALLOCATION CHART

Table 1. MAC for Decontaminating Apparatus: Transportable Small Scale, M26.

(1) GROUP NUMBER	(2) COMPONENT/ ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL				(5) TOOLS AND EQUIPMENT REF CODE	(6) REMARKS CODE
			FIELD		SUSTAINMENT			
			CREW	MAINTAINER	BELOW DEPOT	DEPOT		
			C	F	H	D		
00	Decon Apparatus M-26	Inspect	0.25	0.50				C
01	Applicator Module	Inspect	0.25	0.25				C
		Service	0.50	1.0			1,2,3	
		Replace		0.25				
		Repair		3.5			2,3	
		Rebuild				2.0		A
0101	Pump, Reciprocating	Inspect	0.15					
		Service	0.10	1.0			1,2,3	
		Replace		1.5			2,3	B
		Repair		0.75			2,3	D
		Rebuild				4.0		A
0102	Fan, Centrifugal (Blower)	Repair		0.50			2,3	E
		Replace		1.0			2,3	B
		Adjust		0.25			2,3	
0103	Electrical System (Control Box)	Test		0.25			2,3,4	
		Repair		1.5			2,3	B
		Replace		2.0				
		Rebuild				4.5		
0104	Water Piping System	Repair		0.50			2,3	
		Service	0.20	0.20			1,2,3	
0105	Fuel Piping Assembly	Replace		1.25			2,3	
0106	Flow Heater	Service		1.5			2,3	
		Repair		0.75			2,3	
		Rebuild				3.0		A,B
		Replace		2.0			2,3	
0107	Engine	Service	0.15	0.25			1,2,3	
		Repair		0.75			2,3	
		Replace		2.0			2,3	
		Rebuild				8.0		A
0108	Frame Assembly	Inspect	0.25	0.25				
		Replace				8.0		A, F
		Repair		0.20			2,3	

Table 1. MAC for Decontaminating Apparatus: Transportable Small Scale, M26 – Continued.

(1) GROUP NUMBER	(2) COMPONENT/ ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL				(5) TOOLS AND EQUIPMENT REF CODES	(6) REMARKS CODE
			FIELD		SUSTAINMENT			
			CREW	MAINTAINER	BELOW DEPOT	DEPOT		
			C	F	H	D		
02	Accessory Kit	Replace		0.25				
		Inspect	0.50	0.50				
		Repair		0.50			1,2,3	
	Shower Assembly	Test		0.10			2,3,4	
		Repair		0.50			2,3	
		Replace		0.25			2,3	
		Rebuild				3.5		
		Inspect	0.30	0.30				

Table 2. MAC for 3,000-Gallon Water Tank.

(1) GROUP NUMBER	(2) COMPONENT/ ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL				(5) TOOLS AND EQUIPMENT REF CODES	(6) REMARKS CODE
			FIELD		SUSTAINMENT			
			CREW	MAINTAINER	BELOW DEPOT	DEPOT		
			C	F	H	D		
03	3000-Gallon Water Tank	Repair	0.10	0.50				G
		Replace		0.10				
		Inspect	0.10					G

MAINTENANCE ALLOCATION CHART, TOOLS AND TEST EQUIPMENT

Table 3. Tools and Test Equipment for M-26.

TOOLS OR TEST EQUIPMENT	MAINTENANCE LEVEL	NOMENCLATURE	NATIONAL STOCK NUMBER	TOOL NUMBER
1	C	Tool Kit, Accessory	TBD	Accessory Kit
2	F	Tool Kit, General Mechanics/GMTK	5180-01-483-0249	SC 5180-95-B47
		Tool Kit, General Mechanics/GMTK USMC	5180-01-554-4224	C79152B
3	F	Tool Set, Standard Automotive/SATS	4910-01-490-6543	SC 4910-95-A81
4	F	Thermometer, self indicating. Bi-metallic (or equivalent; must have operating temperature range of 0 to 220 °F (-17 to 104 °C).)	6685-00-373-3436	2CBM8

Table 4. Remarks for M-26.

REMARKS CODE	REMARKS
A	Major repairs/rebuild required by Depot Facility.
B	If major repairs are required, replace the unserviceable system or part with a serviceable system or component and turn in the component to Depot Facility for rebuild.
C	Operator limited to Preventive Maintenance Checks and Services (PMCS).
D	Field level repairs limited to water pump valve, pulsation damper (pressure accumulator), clutch, water pump belt, water pump pulley, vent mounting gasket, sight glass, check valve replacement, safety valve, check valve, pump valve plate and springs, and manometer replacement.
E	Replace fuel pump adapters and fuel line adapters with new components when replacing the blower fuel pump.
F	Replacement requires evacuation of next higher assembly to Depot Facility for reassembly and testing.
G	Refer to TM 10-5430-237-12&P.

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
EXPENDABLE AND DURABLE ITEMS LIST (EDIL)

INTRODUCTION

SCOPE

This work package lists expendable and durable items that you will need to operate and maintain the M-26. This list is for information only and is not authority to requisition the listed items. These items are authorized to you by CTA 50-970, Expendable/Durable items (Except Medical, Class V Repair Parts, and Heraldic Items), or CTA 8-100, Army Medical Department Expendable/Durable Items.

EXPLANATION OF COLUMNS IN THE EXPENDABLE/DURABLE ITEMS LIST

Column (1) Item No. This number is assigned to the entry in the list and is referenced in the narrative instructions to identify the item (e.g., Use brake fluid (WP 0098, Item 5)).

Column (2) Level. This column identifies the lowest level of maintenance that requires the listed item: C = Crew, F = Maintainer.

Column (3) National Stock Number (NSN). This is the NSN assigned to the item which you can use to requisition it.

Column (4) Item Name, Description, Part Number/(CAGEC). This column provides the other information you need to identify the item. The last line below the description is the part number and the Commercial and Government Entity Code (CAGEC) (in parentheses)

Column (5) U/I. Unit of Issue (U/I) code shows the physical measurement or count an item, such as gallon, dozen, gross, etc.

Table 1. Expendable/Durable Items List (EDIL).

(1) Item No.	(2) Level	(3) National Stock Number (NSN)	(4) Item Name, Description, Part Number/(CAGEC)	(5) U/I
1	F	8040-01-147-6849	Adhesive, Rubber, Black, Paste, Used for Gaskets and Weather stripping 08008 (34360)	TU
2	C	6810-01-181-7121	Antifreeze, Propylene Glycol MIL-P-83800/GL (13873)	GL
3	C	6850-12-175-4344	Calcium Inhibitor, 5 L (1.3 gal) TK 6850-034 (D9476)	EA
4	C	7920-00-044-9281	Cloth, Cleaning A-A-59323 (58536)	BX
5	F	6850-01-560-6131	Decalcifying Solution, Calcium/Lime/Rust (CLR) CLR-5 GALLON (9X051)	PT
6	C	9150-12-374-7676	Grease, General Purpose, Pump, 400 gram filling 6.666.674.0 (D0356)	EA
7	F	5325-12-374-7419	Grommet, Nonmetallic 6.641-406.0 (D0356)	EA
8	F	5325-12-374-7418	Grommet, Nonmetallic 6.641-422.0 (D0356)	
9	F	5970-01-572-2645	Insulation Sleeve 7227K12 (39428)	EA
10	C	9150-01-421-1427	Oil, Lubricating, Engine SAE15W40 MIL-PRF-2104 (81349)	QT
11	F		Oil, Water Pump SAE40W A0A-114-3440 (59776)	QT
12	F	4940-01-543-4422	Pan, Drip ODP12 (0N5W4)	EA
13	F	6850-01-474-2302	Solvent, Cleaning Compound MIL-PRF-680 (81349)	GL
14	F	5975-00-111-3208	Strap, Tie-down, Electrical MS3367-5-9 (81343)	EA
15	F	8135-00-239-1648	Tags, Marking 34MR (16956)	EA
16	F	5970-00-644-3167	Tape, Insulation, Electrical 1756653 (80064)	EA
17	F	7510-00-266-6710	Tape, Pressure Sensitive 802563 (18876)	YD
18	F	4920-01-212-9235	Tape, Teflon 4012477-001 (19378)	EA

END OF TASK

END OF WORK PACKAGE

FIELD MAINTENANCE
DECONTAMINATING APPARATUS: TRANSPORTABLE SMALL SCALE, M-26
TORQUE LIMITS

TORQUE TABLES

When To Use Torque Limits

When a torque is not specified in an individual work package, use the procedures in this work package to determine proper torque limits and use of adapters with torque wrenches.

When To Use Adapters With Torque Wrenches

When an adapter is necessary due to space or type of fitting being torqued, it must be determined how the adapter changes the amount of force applied. If the adapter increases or decreases the distance from the drive of the torque wrench to the fitting being torqued, an equation must be used to compensate for the difference.

HOW TO USE ADAPTERS WITH TORQUE WRENCHES

NOTE

The following abbreviations apply to the below procedures:
DT = Desired Torque
LT = Length of Torque Wrench
AL = Adapter Length
AT = Applied Torque

1. If the adapter used decreases the distance between the center of the torque wrench handle and the center of the drive, first find the desired torque for the fitting, then calculate as follows:

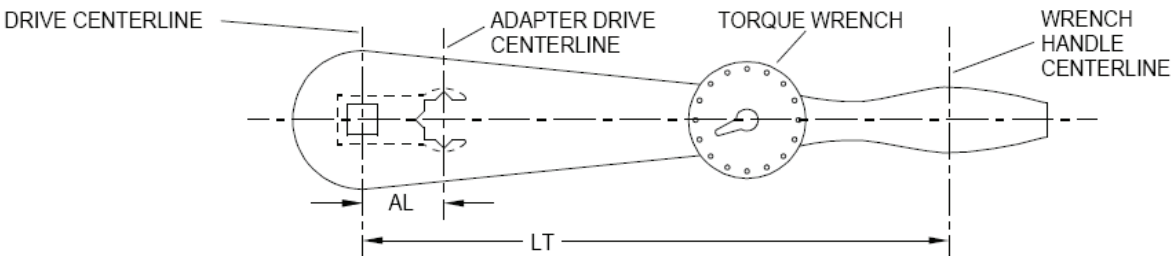


Figure 1. Torque Wrench.

a. Multiply DT by LT.

b. Subtract AL from LT.

c. Divide the first answer by the second answer to find AT.

HOW TO USE ADAPTERS WITH TORQUE WRENCHES - CONTINUED

2. If the adapter used increases the distance between the center of the torque wrench handle and the center of the drive, first find the desired torque for the fitting, then calculate as follows:

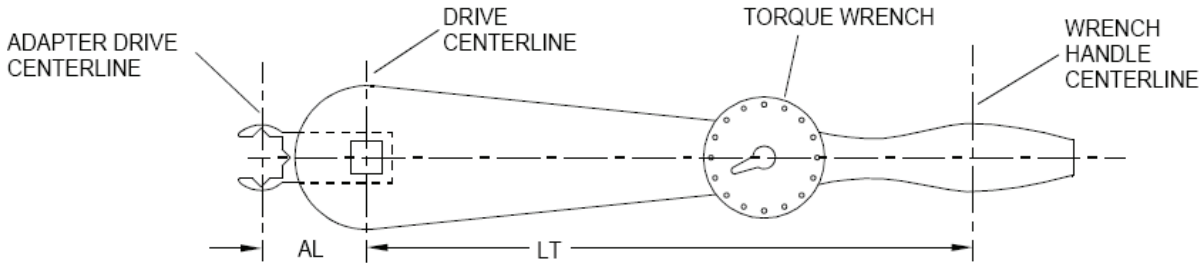


Figure 2. Torque Wrench.

   a. Multiply DT by LT.

   b. Add AL and LT.

   c. Divide the first answer by the second answer to find AT.

HOW TO USE TORQUE TABLES

1. Measure the diameter of the bolt to be torqued.

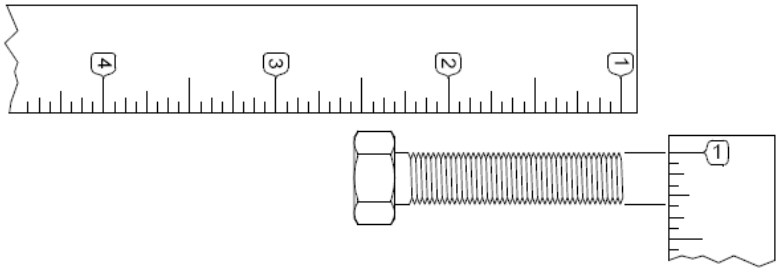


Figure 3. Torque Wrench Measurement.

2. For Society of Automotive Engineers (SAE) fasteners, determine the threads per inch by counting the threads. For metric fasteners determine the thread pitch using a thread pitch page.

3. Determine the type of markings on the bolt you are torquing by comparing the markings on the head of the bolt with the chart below.

HOW TO USE TORQUE TABLES - CONTINUED

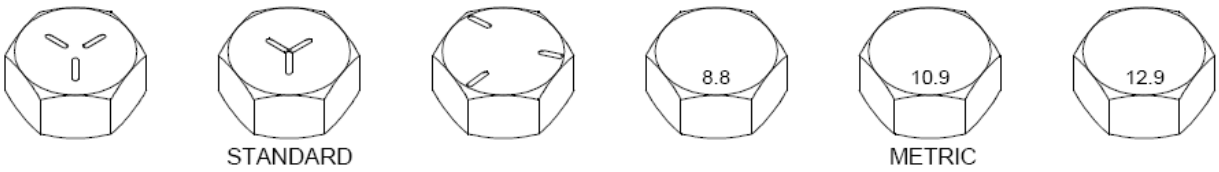


Figure 4. Torque Wrench Standard and Metric.

4. Determine if this will be a wet or dry torque

    a. Wet torque is any bolt that is lubricated or coated with an antiseize compound.

    b. Dry torque us any bolt that is not lubricated with an antiseize compound.

5. On the table below, locate the bolt to be torqued.

    a. Locate the diameter of the bolt.

    b. Determine the threads per inch for the SAE fastener or the thread pitch for the metric fastener.

    c. Slide across the table to the proper grade.

    d. Choose wet or dry.

    e. Slide down the proper column and across the proper row until they intersect, this is the proper torque value.

Table 1. SAE Standard Torque Table

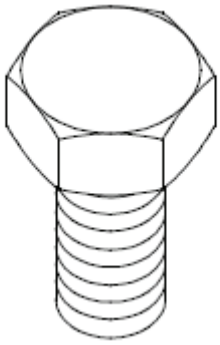
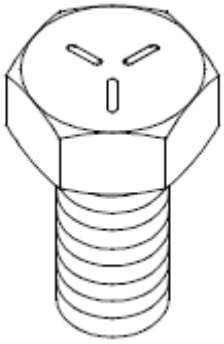
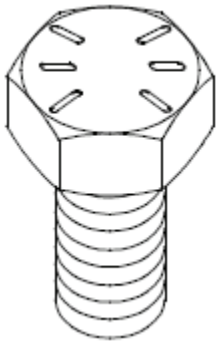
		SAE GRADE NO. 2				SAE GRADE NO. 5				SAE GRADE NO. 8			
													
		DRY		WET		DRY		WET		DRY		WET	
DIA IN.	THREADS PER IN.	IN. LB	N-M	IN. LB	N-M	IN. LB	N-M	IN. LB	N-M	IN. LB	N-M	IN. LB	N-M
1/4	20	66	7.46	49	5.54	101	11.41	76	8.58	143	16.15	107	12.09
1/4	28	75	8.47	56	6.33	116	13.10	87	9.83	164	18.53	123	13.89
5/16	18	135	15.25	101	11.41	209	23.61	157	17.73	295	33.32	221	24.96
5/16	24	150	17.17	112	12.65	230	25.98	173	19.54	327	36.94	245	27.68
3/8	16	240	27.11	180	20.33	370	41.80	278	31.40	523	59.08	392	44.28
3/8	24	272	30.73	204	23.04	420	47.44	315	35.58	593	66.99	445	50.27
7/16	14	384	43.38	288	32.53	593	66.99	445	50.27	837	94.55	628	70.94
7/16	20	428	48.35	321	36.26	662	74.78	496	56.03	935	105.62	700	79.07
1/2	13	585	66.08 4	39	49.59	904	102.12	678	76.59	1277	144.25	958	108.22
1/2	20	660	74.55	495	55.92	1020	115.22	764	86.30	1440	162.66	1080	122.00

Table 2. SAE Standard Torque Table

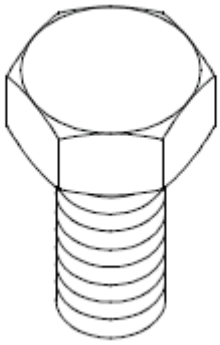
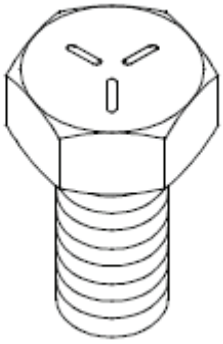
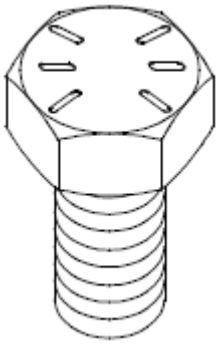
		SAE GRADE NO. 2				SAE GRADE NO. 5				SAE GRADE NO. 8			
													
		DRY		WET		DRY		WET		DRY		WET	
DIA IN.	THREADS PER IN.	FT LB	N-M	FT LB	N-M	FT LB	N-M	FT LB	N-M	FT LB	N-M	FT LB	N-M
9/16	12	70	94.92	53	71.87	109	147.80	82	111.19	154	208.82	115	155.94
9/16	18	78	105.77	59	80.00	121	164.08	91	123.40	171	231.88	128	173.57
5/8	11	97	131.53	73	98.99	150	203.40	113	153.23	212	287.47	159	215.60
5/8	18	110	149.16	82	111.19	170	230.52	127	172.21	240	325.44	180	244.08
3/4	10	172	233.23	129	174.92	269	364.76	201	272.56	376	509.86	282	382.39
3/4	16	192	260.35	144	195.26	297	402.73	223	302.29	420	569.52	315	427.14
1	8	-	-	-	-	644	873.26	483	654.95	909	1232.60	683	926.15
1	12	-	-	-	-	704	954.62	528	715.97	995	1349.22	746	1011.58

Table 3. Metric Torque Table

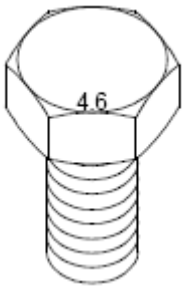
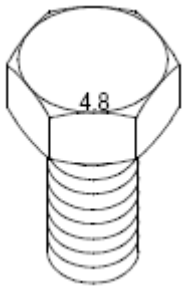
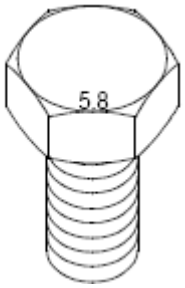
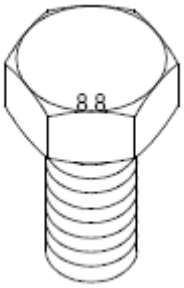
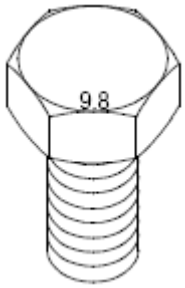
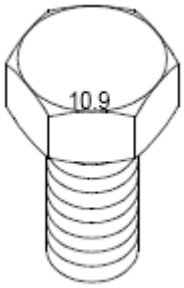
		CLASS 4.6				CLASS 4.8				CLASS 5.8			
													
		DRY		WET		DRY		WET		DRY		WET	
DIA IN.	THREAD PITCH	N-M	IN. LB	N-M	IN. LB	N-M	IN. LB	N-M	IN. LB	N-M	IN. LB	N-M	IN. LB
3.0	0.5	.50	4	.40	4	.70	6	.50	4	-	-	-	-
3.5	0.6	.80	7	.60	5	1.10	10	.80	7	-	-	-	-
4.0	0.7	1.20	11	.90	8	1.60	14	1.20	11	-	-	-	-
5.0	0.8	2.40	21	1.80	16	3.30	29	2.50	22	4.00	35	3.00	27
6.0	1.0	4.00	35	3.00	27	5.66	50	4.20	37	6.90	61	5.20	46
8.0	1.25	9.90	88	7.40	66	13.60	120	10.20	90	16.70	148	12.50	111
10.	1..50	19.60	174	14.70	130	27.00	239	20.00	177	33.10	293	24.80	220
12.0	1.75	34.10	302	25.60	227	47.00	416	35.00	310	58.00	513	43.00	381
14.0	2.0	54.30	481	40.80	361	75.00	664	56.00	496	92.00	814	69.00	611

Table 4. Metric Standard Torque Table

		CLASS 8.8				CLASS 9.8				CLASS 10.9			
													
		DRY		WET		DRY		WET		DRY		WET	
DIA IN.	THREAD PITCH	N-M	FT LB	N-M	FT LB	N-M	FT LB	N-M	FT LB	N-M	FT LB	N-M	FT LB
8.0	1.25	26.40	19	19.80	15	28.50	21	21.40	16	36.50	27	27.30	20
10.0	1.50	52.20	38	39.20	29	56.60	42	42.40	31	72.20	53	54.20	40
12.0	1.75	91.00	67	68.00	50	99.00	73	74.00	55	126.00	93	94.00	69
14.0	2.00	145.00	107	109.00	80	157.00	116	118.00	87	200.00	147	150.00	111
16.0	2.00	226.00	167	170.00	125	245.00	181	184.00	136	313.00	231	235.00	173
20.0	2.50	441.00	325	331.00	244	478.00	353	358.00	264	610.00	450	458.00	338
24.0	3.00	762.00	562	572.00	422	826.00	609	620.00	457	1055.00	778	791.00	583
30.0	3.50	1515.00	1117	1136.00	838	1641.00	1210	1231.00	908	2095.00	1545	1572.00	1159
36.0	4.00	2647.00	1952	1985.00	1464	2868.00	2115	2151.00	1586	3662.00	2701	2746.00	2025

END OF WORK PACKAGE

MAJOR COMPONENT TASK INDEX

Subject — WP Sequence No.– Page No.

ELECTRICAL SYSTEM (CONTROL BOX)

Battery Service ..... WP 0025-1
Battery Test and Removal ..... WP 0025-3
Battery Installation ..... WP 0025-4
Battery Terminal Lug Removal and Installation ..... WP 0025-4
Negative Battery Ground Cable Removal ..... WP 0025-5
Negative Battery Ground Cable Installation ..... WP 0025-6
Engine Ground Cable Removal ..... WP 0025-7
Engine Ground Cable Installation ..... WP 0025-8
Engine Power Cable Removal ..... WP 0025-9
Engine Power Cable Installation ..... WP 0025-10
Control Box Power Cable Removal ..... WP 0025-10
Control Box Power Cable Installation ..... WP 0025-12
Control Box Removal ..... WP 0026-1
Control Box Installation ..... WP 0026-9
Control Panel Light Removal ..... WP 0027-1
Control Panel Light Installation ..... WP 0027-3
Starter, Control, Ignition and Chemistry Pump Fuse Removal ..... WP 0028-1
Starter, Control, Ignition and Chemistry Pump Fuse Installation ..... WP 0028-3
Electrical Relay Removal ..... WP 0029-1
Electrical Relay Installation ..... WP 0029-3
Selector Switch Inspection ..... WP 0030-1
Selector Switch Removal ..... WP 0030-3
Selector Switch Installation ..... WP 0030-5
Hour Meter Removal ..... WP 0031-1
Hour Meter Installation ..... WP 0031-2
Preheater Oil and Air Switches Removal ..... WP 0032-1
Preheater Oil and Air Switches Installation ..... WP 0032-5
Burner Control Circuit Breaker Removal ..... WP 0033-1
Burner Control Circuit Breaker Installation ..... WP 0033-3
Burner Rectifier Removal ..... WP 0034-1
Burner Rectifier Installation ..... WP 0034-4
Temperature Gauge Functional Test ..... WP 0035-1
Temperature Gauge/Thermostat Removal ..... WP 0035-3

MAJOR COMPONENT TASK INDEX

Subject — WP Sequence No.– Page No.

INDEX (CONT'D)

ELECTRICAL SYSTEM (CONTINUED)

Temperature Gauge/Thermostat Installation ..... WP 0035-7
Charging System Test and Removal ..... WP 0036-1
Charging System Installation ..... WP 0036-5

ENGINE, DIESEL

Engine Fuel Supply Line Removal ..... WP 0041-1
Engine Fuel Supply Line Installation ..... WP 0041-2
Engine Replacement Introduction ..... WP 0050-1
Engine Removal ..... WP 0050-3
Engine Installation ..... WP 0050-7
Changing Engine Oil and Oil Filter ..... WP 0051-1
Oil Dipstick Removal ..... WP 0052-1
Oil Dipstick Installation ..... WP 0052-2
Air Filter Element Removal and Installation ..... WP 0053-1
Air Filter Assembly Disassembly ..... WP 0053-2
Air Filter Assembly Inspection ..... WP 0053-3
Assemble Air Filter Assembly ..... WP 0053-3
Air Filter Assembly Removal ..... WP 0053.1-1
Air Filter Assembly Cleaning and Installation ..... WP 0053.1-3
Fuel Filter Removal ..... WP 0054-1
Fuel Filter Installation ..... WP 0054-2
Mechanically Bleeding Fuel System ..... WP 0055-1
Manually Bleeding Fuel System ..... WP 0055-2
Engine Valve Cover and Gasket Removal ..... WP 0056-1
Engine Valve Cover and Gasket Installation ..... WP 0056-2
Engine Valve Clearance Check and Adjustment ..... WP 0057-1
Engine Cooling Fins Cleaning ..... WP 0058-1
Engine Fuel Pump Removal ..... WP 0059-1
Engine Fuel Pump Installation ..... WP 0059-3
Starter Test ..... WP 0060-1
Starter Removal ..... WP 0060-3
Starter Installation ..... WP 0060-4
Throttle Control Inspection ..... WP 0061-1

MAJOR COMPONENT TASK INDEX

Subject — WP Sequence No.– Page No.

INDEX (CONT'D)

ENGINE, DIESEL (CONTINUED)

Throttle Control Removal ..... WP 0061-2
Throttle Control Installation ..... WP 0061-3
Emergency Fuel Shutoff Valve Removal ..... WP 0063-1
Emergency Fuel Shutoff Valve Installation ..... WP 0063-2
Exhaust Pipe Removal ..... WP 0064-1
Exhaust Pipe Installation ..... WP 0064-2

FAN, CENTRIFUGAL (BLOWER)

Blower V-Belt Adjustment ..... WP 0011-6
Blower V-Belt Removal/Installation ..... WP 0011-7
Blower Unit Removal ..... WP 0021-1
Blower Unit Installation ..... WP 0021-4

FLOW HEATER

Burner Unit Cloth Collar Removal ..... WP 0022-1
Burner Unit Cloth Collar Installation ..... WP 0022-2
Burner Fuel Pump and Fuel Pump Coupling Removal ..... WP 0023-1
Burner Fuel Pump and Fuel Pump Coupling Installation ..... WP 0023-4
Burner Fuel Hose Removal ..... WP 0023-6
Burner Fuel Hose Installation ..... WP 0023-8
Blower Unit Damper Spring Removal ..... WP 0024-1
Blower Unit Damper Spring Installation ..... WP 0024-4
Flow Heater Maintenance ..... WP 0043-1
Flow Heater Decalcifying Maintenance ..... WP 0044-1
Igniter Electrode Removal ..... WP 0045-1
Igniter Electrode Gap Adjustment ..... WP 0045-3
Igniter Electrode Installation ..... WP 0045-4
Burner Nozzle Removal ..... WP 0046-1
Burner Nozzle Clean/Replace ..... WP 0046-2
Burner Nozzle Installation ..... WP 0046-3
Burner Photo Cell Cleaning/Inspection/Removal ..... WP 0047-1
Burner Photo Cell Installation ..... WP 0047-3

MAJOR COMPONENT TASK INDEX

Subject — WP Sequence No.– Page No.

INDEX (CONT'D)

FLOW HEATER (CONTINUED)

Flow Heater Removal ..... WP 0049-1
Flow Heater Installation ..... WP 0049-6

FRAME ASSEMBLY

Handle and Handle Cover Replacement ..... WP 0065-1

FUEL PIPING ASSEMBLY

Low Fuel Sensor Removal ..... WP 0042-1
Low Fuel Sensor Installation ..... WP 0042-2
Burner Fuel Line Removal ..... WP 0048-1
Burner Fuel Line Installation ..... WP 0048-3
Main Fuel Supply Line Removal ..... WP 0062-1
Main Fuel Supply Line Installation ..... WP 0062-3

PUMP, RECIPROCATING (WATER PUMP)

Changing Water Pump Oil ..... WP 0009-1
Water Pump Removal ..... WP 0010-1
Water Pump Installation ..... WP 0010-5
Water Pump Clutch Assembly Removal ..... WP 0010-8
Water Pump Clutch Assembly Installation ..... WP 0010-11
Water Pump V-Belt Adjustment ..... WP 0011-1
Water Pump V-Belt Removal ..... WP 0011-3
Water Pump V-Belt Installation ..... WP 0011-5
Water Pressure Gauge Removal ..... WP 0012-1
Water Pressure Gauge Installation ..... WP 0012-2
Safety Valve Testing ..... WP 0014-1
Safety Valve Removal ..... WP 0014-2
Safety Valve Installation ..... WP 0014-3
Pulsation Damper Testing ..... WP 0016-1
Pulsation Damper Removal and Installation ..... WP 0016-3
Water Pump Sight Glass Removal ..... WP 0017-1
Water Pump Sight Glass Installation ..... WP 0017-2
Water Pump Check Valve Removal and Cleaning ..... WP 0018-1
Water Pump Check Valve Installation ..... WP 0018-2

MAJOR COMPONENT TASK INDEX

Subject — WP Sequence No.– Page No.

INDEX (CONT'D)

PUMP, RECIPROCATING (CONTINUED)

Water Pump Valve Cleaning and Removal ..... WP 0019-1
Water Pump Valve Installation ..... WP 0019-2
Water Pump Filler/Vent Mounting Gasket Removal ..... WP 0020-1
Water Pump Filler/Vent Mounting Gasket Installation ..... WP 0020-2

SHOWER ASSEMBLY

Maintenance of Shower Assembly Introduction ..... WP 0066-1
Shower Injector Safety Valve Assembly Functional Test ..... WP 0066-2
Shower Injector Safety Valve Assembly Replacement ..... WP 0066-6
Shower Injector Suction Hose Replacement ..... WP 0066-7
Shower Tube and Spray Nozzle Removal/Inspection and Replacement ..... WP 0066-8
Shower Tube Coupling Replacement ..... WP 0066-9
Shower Hose Replacement ..... WP 0066-10

WATER PIPING SYSTEM

High-Pressure Input Hose Removal ..... WP 0013-1
High-Pressure Input Hose Installation ..... WP 0013-2
High Pressure Output Hose Removal ..... WP 0013-2
High-Pressure Output Hose Installation ..... WP 0013-4
Safety System Removal ..... WP 0015-1
Safety System Installation ..... WP 0015-4
Calcium Inhibitor Filter Removal ..... WP 0037-1
Calcium Inhibitor Filter Installation ..... WP 0037-2
High-Pressure Burner Outlet Removal ..... WP 0038-1
High-Pressure Burner Outlet Installation ..... WP 0038-2
Calcium Inhibitor Injection Screen Removal ..... WP 0039-1
Calcium Inhibitor Injection Screen Installation ..... WP 0039-2
Metering Valve Removal ..... WP 0040-1
Metering Valve Installation ..... WP 0040-2

RECOMMENDED CHANGES TO PUBLICATIONS AND BLANK FORMS For use of this form, see AR 25-30; the proponent agency is OAASA.	Use Part II *(reverse)* for Repair Parts and Special Tool Lists (RPSTL) and Supply Catalogs/Supply Manuals (SC/SM).	DATE *Date you filled out this form.*
TO *(Forward to proponent of publication or form) (Include ZIP Code)* U.S. Army TACOM Life Cycle Management Command ATTN: AMSTA-LCL-MPP/TECH PUBS 6501 E. 11 Mile Road, Warren, MI 48397-5000	**FROM** *(Activity and location) (Include ZIP Code)* *Your mailing address*	

PART I – ALL PUBLICATIONS (EXCEPT RPSTL AND SC/SM) AND BLANK FORMS

PUBLICATION/FORM NUMBER	DATE	TITLE
TM Number	*Date of the TM*	*Title of the TM*

ITEM	PAGE	PARA-GRAPH	LINE	FIGURE NO.	TABLE	RECOMMENDED CHANGES AND REASON (Exact wording of recommended change must be given)
	0007-3					*Figure 2, Item 9 should show a lockwasher. Currently shows a flat washer.*
	0018-2					*Cleaning and inspection, Step 6, reference to governor support pin (14) is wrong reference. Reference should be change to (12).*

SAMPLE

TYPED NAME, GRADE OR TITLE	TELEPHONE EXCHANGE/AUTOVON, PLUS EXTENSION	SIGNATURE
Your Name	*Your Phone Number*	*Your Signature*

TO *(Forward direct to addressee listed in publication)*	**FROM** *(Activity and location) (Include ZIP Code)*	**DATE**
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PART II – REPAIR PARTS AND SPECIAL TOOL LISTS AND SUPPLY CATALOGS/SUPPLY MANUALS

PUBLICATION NUMBER	DATE	TITLE
TM Number	*Date of the TM*	*Title of the TM*

PAGE NO.	COLM NO.	LINE NO.	NATIONAL STOCK NUMBER	REFERENCE NO.	FIGURE NO.	ITEM NO.	TOTAL NO. OF MAJOR ITEMS SUPPORTED	RECOMMENDED ACTION

SAMPLE

PART III – REMARKS *(Any general remarks, or recommendations, or suggestions for improvement of publications and blank forms. Additional blank sheets may be used if more space is needed.)*

TYPED NAME, GRADE OR TITLE	TELEPHONE EXCHANGE/AUTOVON, PLUS EXTENSION	SIGNATURE
Your Name	*Your Phone Number*	*Your Signature*

APD V4.00

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PART I – ALL PUBLICATIONS (EXCEPT RPSTL AND SC/SM) AND BLANK FORMS

PUBLICATION/FORM NUMBER	DATE	TITLE
TM 3-4230-238-23&P	31 December 2012	Field Maintenance Manual for Decontaminating Apparatus: Joint Service Transportable Small Scale, M26

	PAGE	PARA-GRAPH	LINE	FIGURE NO.	TABLE	RECOMMENDED CHANGES AND REASON

TYPED NAME, GRADE OR TITLE	TELEPHONE EXCHANGE/AUTOVON, PLUS EXTENSION	SIGNATURE

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U.S. Army TACOM Life Cycle Management Command ATTN: AMSTA-LCL-MPP/TECH PUBS 6501 E. 11 Mile Road, Warren, MI 48397-5000		

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TYPED NAME, GRADE OR TITLE	TELEPHONE EXCHANGE/AUTOVON, PLUS EXTENSION	SIGNATURE

APD V4.00

By Order of the Secretary of the Army:

Official:

GEORGE W. CASEY
General, United States Army
Chief of Staff

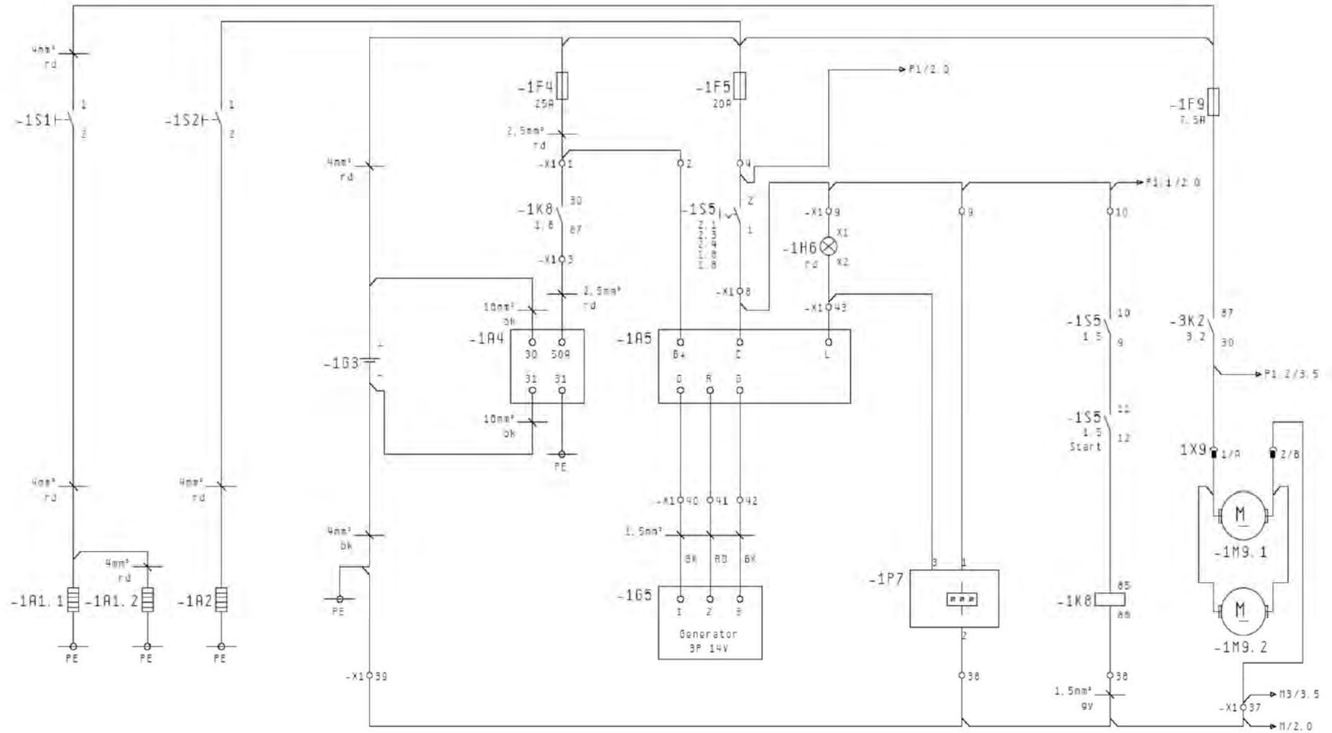
JOYCE E. MORROW
Administrative Assistant to the
Secretary of the Army
0932708

By Order of the Secretary of the Navy:

KEVIN M. MCCOY
Vice Admiral, United States Navy
Commander, Naval Sea System
Command

Army Distribution:

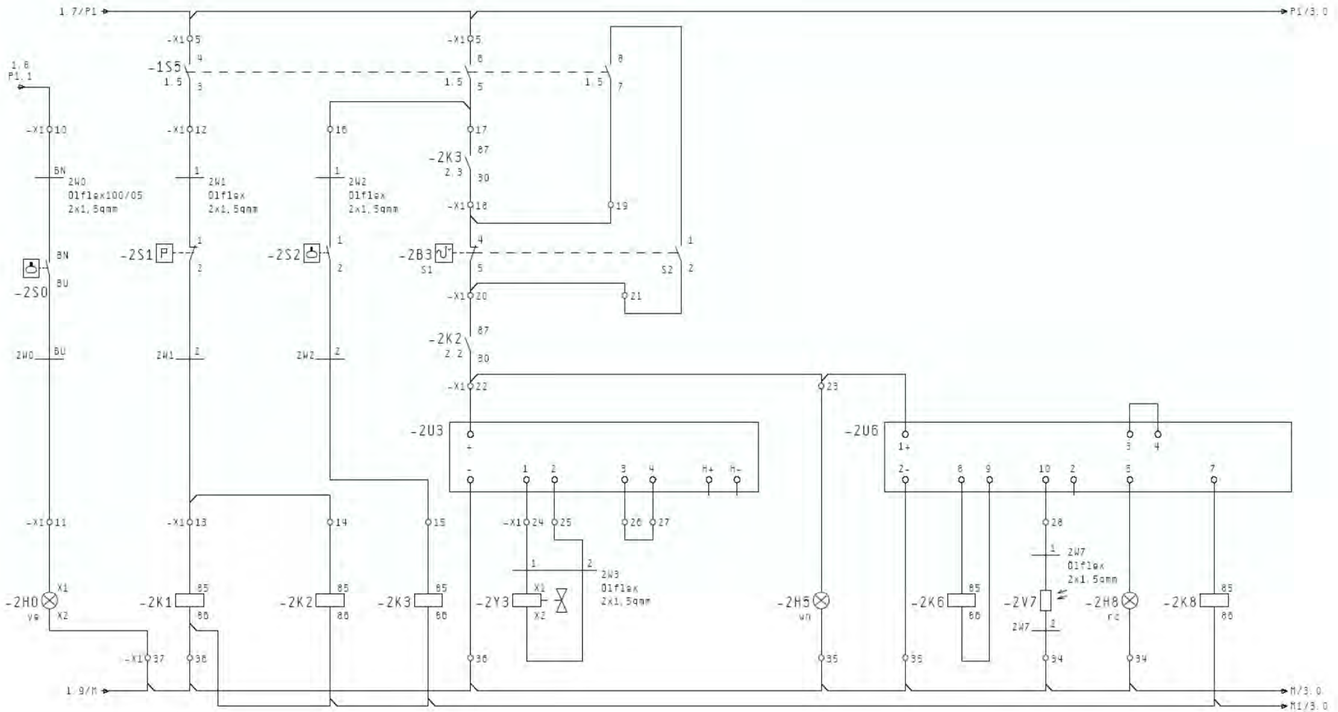
To be distributed in accordance with the initial distribution number (IDN) 280911 requirements for TM 3-4230-238-23&P.



LEGEND:

1A1	Glow plugs for intake air	1G5	Generator 14V~
1A2	Glow plugs for lubricating oil	1H6	Charge indicator lamp
1A4 Sta	rter	1K8	Relay Starter
1A5 R	egulator	1P7	Operating hours Counter
1F4 Sa	fety fuse Starter	1S5	Control switch
1F5	Safety fuse Controlling	1S1	Push button for Glow plugs intake air
1F9	Safety fuse Chemistry pump	1S2	Push button for Glow plugs Lubricating o
1G3	Battery 12V / 45 Ah	1M9	Chemistry pump

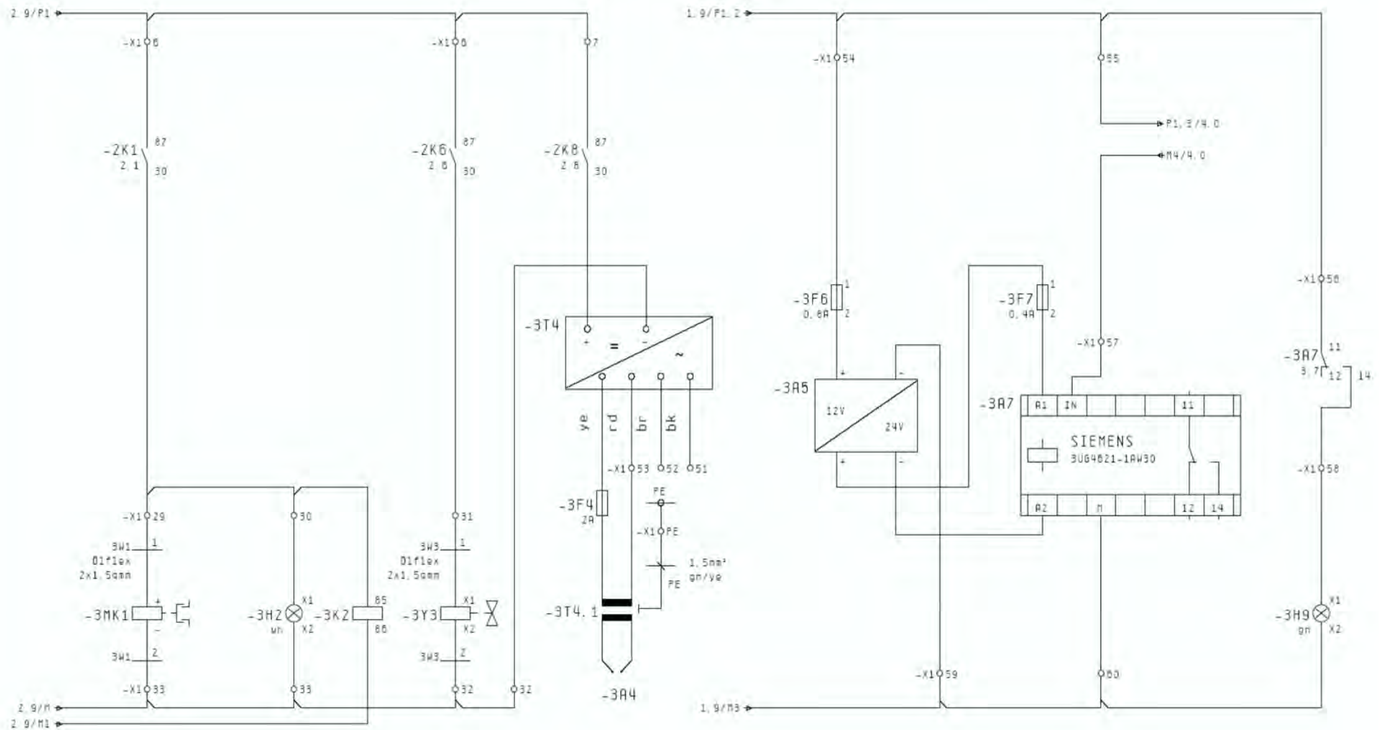
FO-1. M-26 Wiring Diagram (Sheet 1 of 3)
FP-1



LEGEND:

2B3	Temperature monitor	2S0	Can flow switch
2H0	Control lamp Tank	2S1	Pressure switch
2H5	Indicator lamp Burner On	2S2	Water shortage protector
2H8	Indicator lamp Burner malfunction	2U3	Impulser DGT
2K1	Relay Magnetic clutch	2U6	Automatic oil flamer
2K2	Relay DGT	2V7	Photo cell Burner
2K3	Relay Water shortage	2Y3	Magnetic valve DGT
2K6	Relay Fuel		
2K8	Relay Ignition transformer		

FO-2. M-26 Wiring Diagram (Sheet 2 of 3)
FP-2



LEGEND:

3A4	Ignition electrodes
3F4	Safety fuse Ignition transformer
3F6	Safety fuse Power unit input 12V
3F7	Safety fuse Power unit output 24V
3H2	Indicator lamp Pump On
3MK1	Magnetic clutch
3K2	Relay Chemistry pump
3T4	Converter 12V=/ 220V~
3T4.1	Ignition transformer
3Y3	Magnetic valve Fuel
3A5	DC Converter 12V / 24V

FO-3. M-26 Wiring Diagram (Sheet 3 of 3)
FP-3

PIN 085998-000